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CONTENTS

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Balance Assessment in Cerebral Palsy Children Using Pediatric Reach Test and Pediatric Balance Scale

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ABSTRACT

Background: Cerebral palsy describes a group of permanent disorders of development of movement and posture causing activity limitation. Spastic cerebral palsy is far the most common type, occurring in 70-80% of all cases. Postural dysfunction was found during standing and walking in these children together with coordination problems. The present study focusses on the assessment of balance in Cerebral palsy children using "pediatric reach test and pediatric balance scale".

Methodology: A total of 15 samples were selected for the study based on inclusion and exclusion criteria in the age range of 3-15 years. All the subjects had functional range of motion at hip, knee and ankle joint. Gross Motor Function Classification System for cerebral Palsy (level 2 or 3) were included.

Results: t- test was applied for the scoring between the pediatric balance scale and pediatric reach test. The calculated t-value (4.9) was found to be significant at $p < 0.001$

Conclusion: Both pediatric reach test and pediatric balance scale are efficient but, pediatric balance scale is more efficient in quantifying functional balance in children with cerebral palsy.

Keywords: *cerebral palsy, pediatric reach test, pediatric balance scale*

INTRODUCTION

A 2010 six-country survey found an incidence of cerebral palsy of 2.12–2.45 per 1,000 live births, indicating a slight rise in recent years. Cerebral palsy describes a group of permanent disorders of the development of movement and posture causing activity limitation. Spastic cerebral palsy is far the most common type, occurring in 70-80% of all cases.[1] Those with this type of cerebral palsy are hypertonic and have a neuromuscular condition stemming from damage to the corticospinal tract, motor cortex or pyramidal tract that affects the nervous system's ability to receive gamma amino butyric acid in the areas affected by the spasticity.[2] Cerebral Palsy patients usually prefer mass movements as they cannot perform isolated movement.[3] Physical therapy and occupational therapy regimens of assisted stretching, strengthening, functional tasks, and/or targeted physical activity and exercise are usually the chief ways to keep spastic cerebral palsy well-managed. Scissor walking and toe walking are common among children with CP who are able to walk [4, 5,6]. The shafts of the bones are often thin (gracile) and become thinner during growth. Depending on the degree of spasticity, a person with CP may exhibit a variety of angular joint deformities. As vertebral bodies need vertical gravitational loading forces to develop properly, spasticity and an abnormal gait can hinder proper and/or full bone and skeletal development.

Balance can be described as the ability to maintain the body's position over its base of support[1], where as postural stability is referred to as balanced stance, which can be achieved by coordinated movements, and these movements of separate body segments are examined with a motion analysis system during standing on a stationary base. Postural dysfunction was found during standing and walking in children with cerebral palsy

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as studied by Woollacott MH et al.[7] whereas Nasher el al found coordination problems in the uninvolved leg during platform perturbations that involved both legs. Changes in muscle response characteristics contributing to improved recovery include reductions in time of contraction onset, improved muscle response organization, and reduced co-contraction of agonist/ antagonists .[8,9] In most children with CP the basic level of postural control ('direction-specificity', i.e. muscle activation on the side opposite to direction of body sway) was found to be intact .[10,11] Ankle-foot orthoses (AFOs) are frequently prescribed to correct skeletal malalignment in children with spastic diplegia, but their effect on standing balance abilities has not been documented.[12,13] Results revealed that balance responses of children with spasticity were characterized by increased co activation of muscles as opposed to distal to proximal recruitment, decreased presence of upright posture instance. [14]

Functional balance, has been defined as the element(s) of postural control that allow a child to safely perform everyday tasks. A child of school age is expected to function independently within his/her home and school environment when performing self-help (basic activities of daily living), locomotor (mobility), and gross motor activities, including recreational activities/ play (instrumental activities of daily living). As the child approaches adolescence and young adulthood increased proficiency in basic and instrumental activities of daily living is anticipated. Balance, the ability to maintain a state of equilibrium, is one of the critical underlying elements of movement that facilitates the performance of functional skills. Other critical elements for successful function include cognition, vision, vestibular function, muscle strength, and range of motion. The physical therapist must determine if the child possesses adequate functional balance to safely meet the demands of everyday life at home, in school, and within the community.

Current standardized pediatric clinical measures may not provide the clinician with adequate information to fully assess a child with mild to moderate motor impairment's functional balance. A review of balance in the literature suggested that the Berg Balance Scale (BBS) might be useful with the school-age population. The 14 items contained within BBS assess many of the functional activities a child must perform to safely and independently function within his/her home, school, or community. The Pediatric Balance Scale (PBS), a modification of Berg's Balance Scale, developed as a balance measure for school-age children with mild to moderate motor impairments and the Functional Reach Test has been reported to provide reliable measurements when used in children–both developing typically and with neurological diagnoses.

METHODOLOGY

A total of 15 samples of both the gender were selected for the study in the age range of 3-15 years. The included sample had the spasticity grade as per modified ashworth scale not exceeding more than 1+. All the subjects had functional range of motion at hip, knee and ankle joint. The subjects were prior evaluated using mini-mental state examination and the Gross Motor Function Classification System for cerebral Palsy till level 2 or 3 participated in the study. Children with any significant cognitive, attention, behavioral, and/or language disorders were excluded. Children who had undergone orthopedic surgery in previous six months were also excluded, as their motor performance would not have been indicative of their typical motor disabilities.

After obtaining the consent of the patient all the procedures were clearly explained to the subjects. For the pediatric reach test a yard stick was secured to the wall at the height of the patient's acromion on their dominant side. The patient made a fist with his shoulder at 90 degrees of flexion. The examiner instructs the patient to "reach as far as possible". The trial is not counted if the patient touches the wall, the examiner, or moves from their starting position. The difference between the starting and final position of the 3rd metacarpal was recorded. A total of 3 trials were completed in all directions and an average was used. Distance was measured in centimeters.

A 14-item criterion-referenced measure examines functional balance in the context of everyday tasks in the pediatric population was then administered. The equipment needed were an adjustable height bench, a chair with back support and arm rests, a stopwatch or watch with a second hand, masking tape one inch wide, step stool six inches in height, chalkboard eraser, ruler or yardstick. The scoring was then done for the pediatric balance scale. Both the test was administered randomly.

RESULT

Table 1: t- test applied for the scoring between the pediatric balance scale and pediatric reach test. The calculated t-value (4.9) was found to be significant at p<0.001

S.no.	Scale	Balance		SE	Df	T- Value	Probability
		Mean	SD				
1	PRT	581.37	6.44	4.9	28	4.9	P< 0.001 Highly significant
2	PBT	4471.208	17.87				

DISCUSSSION

Examination of balance is an essential element of a physical therapy evaluation for Cerebral palsy child. The clinician must predict the ability of the child to safely and independently function in a variety of environments (i.e., home, school, and community). Valid and reliable functional balance measures are of critical importance if the pediatric physical therapist is to justify that intervention is warranted and demonstrate that improved balance function has occurred because of intervention.

Traditionally, pediatric physical therapists have examined balance through the observation of the underlying elements of the balance response, timed measures of static postures, and standardized developmental measures of gross motor function. The ability to describe the extent to which a child demonstrates righting reactions, protective responses, and equilibrium reactions in response to a therapist generated perturbation formed the foundation of the "classic" balance assessment. Traditional balance assessment also included timed measures of static sitting and standing balance including single limb stance. Standardized examination tools currently utilized by pediatric physical therapists for school-age children with mild to moderate motor impairment include the Bruininks-Oseretsky Test of Motor Proficiency, the Peabody Developmental Motor Scale, and the Gross Motor Function Measure. In addition, clinicians have developed their own non-standardized measures to obtain information relative to the quality of performance during basic and instrumental activities of daily living, and higher-level gross motor tasks. The standardized and non-standardized measures that currently exist provide clinicians with valuable information, but may not fully meet their needs to assess a child's functional balance abilities.

The purpose of the study was to evaluate the efficacy of balance scales in cerebral Palsy children. In the study, pediatric reach test and pediatric balance scale were performed on Diplegic C.P and hemiplegic C.P subjects. It was observed that the mean scores for pediatric balance scale assessment were greater than pediatric reach test. It is also seen that cerebral palsy child faced more difficulty performing pediatric reach test where as these children respond better to pediatric balance scale.

The Functional Reach Test was initially developed for use in adult populations. It measures the distance (using a yardstick at the level of the acromion) that an individual can reach forward from a starting standing position with a fixed base of support without loss of balance. This measure was determined to be a reasonable approximation of a force platform measure of the foot center of pressure excursion (a laboratory-based gold standard), reliable, and feasible to administer in a clinical setting with adults. [15,16,]

The functional balance measures had excellent test-retest reliability and interrater reliability. The discriminate validity indicates that the functional reach test can distinguish cerebral palsy children with different gross motor function classification system (GMFCS) levels whereas the berg balance total score and time up and go test failed to distinguish between children with cerebral palsy with GMFCS levels of 1 and 2. (Mary rose Franjoine et al)[10 ,17] The Functional Reach Test has been modified to incorporate side reaching in addition to forward reaching in both sitting and standing. The available literature consists of various studies on muscle activation characteristics of stance balance control in children with spastic cerebral palsy.[18,19,20]

The pediatric balance test may provide clinicians with a standardized protocol for test administration

and scoring. (kobes et al) [9] The pediatric balance scale has also demonstrated good test-retest and interrater reliability when used with school-age children with mild to moderate motor impairments. [21,22] There is a lot of evidence that the PRT is a simple, valid, and reliable measure with potential for use with children. [23,24]

Further studies may evaluate functional balance in other types of cerebral palsy, namely, ataxic and athetoid to check the utility of these two measures. It is somewhat boredom, frustration, or loss of concentration, especially in children with cerebral palsy to conduct multiple trials and thereby it can be a cause for error which can also be further evaluated. This study provides the clinician with guidelines for interpretation on the basis of age and gender, although the effects of factors such as ethnicity and socioeconomic status on performance of these two tests needs further evaluation.

CONCLUSION

It can be concluded that both pediatric reach test and pediatric balance scale are efficient in evaluation of cerebral palsy children but, pediatric balance scale is more efficient in quantifying functional balance in children with cerebral palsy.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance : Obtained

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Risk Behaviours and Knowledge on Oral Cancer among Adolescents

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ABSTRACT

Background: India is considered as the oral cancer capital of the world. Extensive studies on risk behaviours and public awareness seem to be obligatory.

Objectives: The objectives of the study were to identify the risk behaviours of oral cancer among adolescents and to assess their knowledge on oral cancer.

Method: A descriptive survey design with convenience sampling technique was used. Sample comprised of 160 students from a selected Government Higher Secondary School,Kottayam, Kerala, India. A three point rating scale to identify the risk behaviours of oral cancer & a structured questionnaire to assess the knowledge on oral cancer were used to collect the data.

Results: Of the ten risk behaviors of oral cancer assessed, risk behaviours most *frequently* found include, intake of smoked foods 117(73.1%) , lack of performance of self-oral examination 73(45.6%) and intake of hot or spicy foods 54(33.7%). Majority of the subjects 113(71%) had average knowledge regarding oral cancer. It was also noted that of the various components assessed, the highest knowledge was found on prevention of oral cancer (59%) and the lowest was on clinical manifestations of oral cancer (27%).

Conclusion: The data on risk behaviours show the trend in dietary intake like smoked foods among adolescents. The study findings throw light on the need to conduct large studies on risk behaviours & create awareness on oral cancer among them.

***Keywords*:** *Risk behaviours, Knowledge, Adolescents, Oral cancer*

INTRODUCTION

Cancer has a major impact across the world.[1] Oral cavity cancer is amongst the most prevalent cancers worldwide. Annually, over 3,00, 000 new cases of oral cancer are diagnosed all over the world where the majority are diagnosed in the advanced stages III or IV. The late diagnosis results in low treatment outcomes.[2]

In India, 20 per 1, 00,000 populations are affected by oral cancer which accounts for about 30% of all types of cancer. [3] Over 5 people in India die every hour everyday because of oral cancer.[4] The main risk factors of oral cancer includes tobacco and alcohol use, exposure to ultra violet radiation, Human papilloma virus infection, dietary deficiencies and poor oral and dental hygiene. [5]

Kerala has roughly 35,000 new cancer cases per year. Of this, 50% of cancers are in the throat, mouth and lungs in male & 15% in women caused by tobacco and alcohol habits. There are 913 male and 974 female cancer patients per million in Kerala. Tobacco is a major risk factor responsible for 50% of cancers in Kerala.[6]

Multani S, Reddy JJ Bhat N, Sharma A [7] conducted a study to assess knowledge, attitude, behaviour and interpersonal factors related to the use of tobacco among 1031, 15 to 25 year old youths studying in the different

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colleges in Rajasthan, India. The prevalence of current tobacco use among youth was found to be 493 (47.8%), which is high when compared to other parts of India. The deaths attributed to tobacco, in India, are expected to rise from 1.4% of all deaths in 1990 to 13.3% in 2020. It was estimated that 5,500 adolescents start using tobacco every year in India, joining the 4 million young people under the age of 15 who already use tobacco.

Rakesh PS, Lalu Jand Leelamoni K[8] conducted a study to find out the prevalence of exposure to second hand smoke among 629 higher secondary school students in Ernakulam district, Kerala. The prevalence of ever smokers was 11.9% and of current smokers was 5.2%. Among the study participants, 23.2% were exposed to second hand smoking from a family member and 18.8% from friends. The findings underscore the urgent need for increased efforts to implement the strategies to reduce second hand smoke exposure among adolescents.

Vellappally S, Jacob V, Smejkalová J, Shriharsha P, Kumar V and Fiala, ZA[9]conducted a cross-sectional study to find out the possible relationships between tobacco habits and selected behaviour characteristics among 805adults from India. The highest prevalence of oral mucosal lesions were found in tobacco chewers (22.7 %) followed by regular smokers (12.9 %), occasional smokers (8.6%), ex-smokers (5.1%) and non tobacco users (2.8%) ($p < 0.001$).

Nosayaba Osazuwa-Peters and Nhial T. Tutlam [10] conducted a study to assess the knowledge and perceived risk of developing oral cavity and oropharyngeal cancer among 100 non-medical students of a private Midwestern university in the United States. The results revealed that 81% of the subjects had low knowledge regarding oral cavity and oropharyngeal cancer. The study concluded that oral cavity and oropharyngeal cancer knowledge and risk perception is low among this student population.

Adolescence is a period of acquiring both good and bad habits. The bad habits include tobacco use, alcoholism which has a considerable effect on oral health leading to oral cancer and gum disease. Adolescence is the most influential stage in people's life where health related behaviours are being developed and modified. Oral cancer and gum diseases can be prevented if proper knowledge is provided at an early stage.[11,12] Despite the advertisements and printing the caution messages on tobacco products, there is inadequate awareness on the tobacco chewing and its complications like oral cancer. The researcher could identify very few studies focusing on assessing the knowledge of adolescents specifically on oral cancer. Therefore this study was done with the purpose of identifying risk behaviours among adolescents and assessing their knowledge on oral cancer so that awareness can be enhanced based on the identified risk factors.

MATERIALS AND METHOD

A quantitative approach with descriptive survey design was adopted. The sample comprised of 160 adolescents from a Government Higher Secondary School, Kerala state, India, selected using convenience sampling. Participation of the students in the study was voluntary. Students spent approximately 30 to 50 minutes to complete the questionnaires. The data was collected using (1) demographic proforma which comprised of information related to adolescents such as age, gender, education, area of residence, family history of cancer. It also included information related to oral cancer such as, previous knowledge regarding oral cancer, exposure to cigarette smoke at home, presence of any white patch in oral cavity. Content validity index was found as 0.90.

(2) Rating scale to assess the risk behaviours of adolescents for oral cancer. *10 risk behaviours of oral cancer* based on review of literature were assessed using a three point rating scale . Each of these risk behaviours was assessed under *never, occasionally, and frequently*. The risk behaviours included *seven unhealthy practices* such as use of tobacco/tobacco products, habit of using alcohol, presence of any dental/gum problems, intake of smoked foods, cleaning tongue vigorously, presence of sores or ulcers in mouth and intake of very hot food or spicy foods & *three lack of healthy practices* such as lack of performance of self oral examination, intake of fruits and intake of vegetables. If these three healthy practices have *never* been done they are considered as major risk behaviours. Content validity index was found as 0.96 and the reliability was found as 0.7.

(3) Questionnaire on knowledge of oral cancer was prepared based on literature of oral cancer. It included 32 multiple choice questions on different aspects of oral cancer. It was divided into five parts. This include knowledge on cancer in general, knowledge on risk factors, clinical manifestations, diagnosis and treatment and preventive measures of oral cancer. Each correct

answer carried one mark and wrong answer carried zero. The scores were categorised as poor knowledge: 0-11, average knowledge: 12-22 and good knowledge: 23-32. The above tools were given to seven experts- -Nursing (2), Dental (2), Oncology (1), Head and Neck surgery (2). The content validity was found as 0.93 & reliability was found as 0.70.

Frequency and percentage were used to analyse the socio demographic data, risk behaviours and level of knowledge. Correlation coefficient was used to find out the relationship between level of knowledge and risk behaviours and Chi square test was used to find out the association between risk behaviours and level of knowledge of adolescents on oral cancer with selected demographic variables.

FINDINGS

Section I: Sample characteristics

Majority of the subjects,133(83.1%) were residing in rural area. 21(13.1%) had family history of cancer, of which 2(9.5%) had family history of oral cancer. 19(11.9%) subjects had exposure to tobacco smoke at home which was mainly from the smoking habit of father i.e. 16(84.2%). None of the subjects had a history of white patch in their mouth. Among all the subjects only 32(20%) had heard about oral cancer. Of the 32, 23(71.9%) had heard about oral cancer from media 23(71.9%).

Section II: Risk behaviours of oral cancer among adolescents

n=160

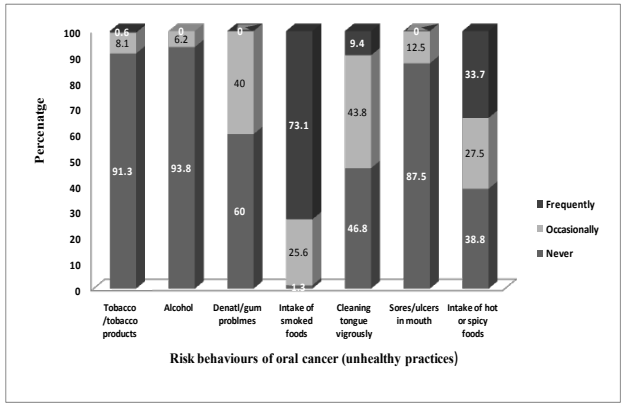

Figure 1: Distribution of subjects based on risk behaviours (unhealthy practices) of oral cancer

Intake of smoked foods 117(73.1%) was identified as the most frequent risk behaviour among adolescents followed by intake of hot or spicy foods 54(33.7%) and cleaning tongue vigorously 15 (9.4%). Habit of using tobacco (frequently-0.6%, occasionally-8.1%) and alcohol (occasionally-6.2%) were found to be low among the subjects .

n=160

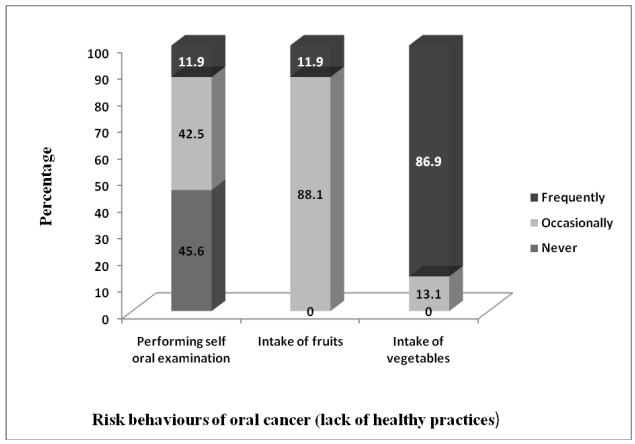

Figure 2: Distribution of subjects based on risk behaviours (lack of healthy practices) of oral cancer.

Two practices found to be least followed by the adolescents were performance of self oral examination and intake of fruits. Nearly half of the subjects 73 (45.6%) never performed self oral examination. Majority of the subjects 141(88.1%) had taken fruits occasionally only.

Section III: Knowledge of adolescents on oral cancer

n=160

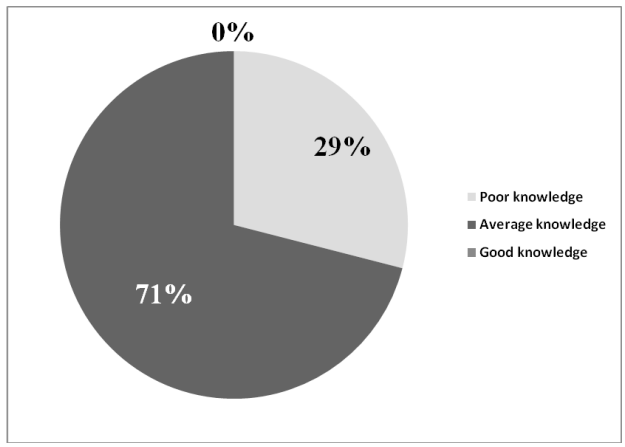

Figure 3 : Pie diagram showing level of knowledge of adolescents regarding oral cancer

Majority of the subjects 113 (71%) had average knowledge regarding oral cancer, 47 (29%) of them had poor knowledge on oral cancer and none of the subjects had good knowledge regarding oral cancer

Table 1: Mean score and Mean score percentage of components of knowledge on oral cancer

n=160

Sl No	Items	Maximum score	Mean score	Mean score Percentage (%)
1	General aspect of cancer	4	1.56	39
2	Risk factors	10	3.81	38
3	Clinical manifestations	6	1.61	27
4	Diagnosis and treatment	5	1.6	32
5	Preventive measures	7	4.15	59
	TOTAL	**32**	**12.7**	**39.8**

Of the five components of knowledge on oral cancer, the mean score percentage was relatively high in the knowledge on preventive measures (59%). The knowledge on clinical manifestation was the poorest scored component with a mean score of 27% .

Section IV: Relationship between the level of knowledge and risk behaviours of oral cancer among adolescents

There was no significant correlation between the level of knowledge and risk behaviours ($r=0.09$, $p>0.05$) of oral cancer among adolescents.

Section V: Association between individual risk behaviours of adolescents on oral cancer and selected demographic variables.

The calculated χ^2 values are greater than the table values at corresponding degrees of freedom for age ($\chi^2_{(2)}=5.99, p<0.05$) and gender($\chi^2_{(2)}=5.99, p<0.001$). Hence there is significant association of age and gender with use of tobacco /tobacco products. The calculated χ^2 values are greater than the table values at corresponding degree of freedom for gender ($\chi^2_{(1)} = 3.84$, $p<0.001$) and area of residence ($\chi^2_{(1)} = 3.84$, $p<0.01$). Hence there is significant association of gender and area of residence with use of alcohol.

DISCUSSION

In this study the risk behaviours most *frequently* found include, intake of smoked foods 117(73.1%) ,lack of performance of self-oral examination 73(45.6%), intake of hot or spicy foods 54(33.7%), cleaning the tongue vigorously 15(9.4%) and habit of using tobacco/ tobacco products 1(0.6%). Occasionally identified risk behaviours include lack of intake of fruits 141(88.1%), dental or gum problems 64(40%), and sores or ulcers in the mouth 20 (12.5%), habit of using alcohol 10 (6.3%) .

Although studies on risk behaviours of oral cancer were available in literature, studies on multiple risk behaviours and studies on individual risk behaviours like smoked foods were very few. However studies were available on single risk behaviour like tobacco/alcohol intake of vegetables and fruits, or a combination of two or three (intake of hot beverages, consumption of vegetarian and non vegetarian food).

The habit of using alcohol & tobacco/tobacco products was found *occasionally* (6.3%, 0.6%) only among the adolescents in the present study. This response may not be accurate as the students may be afraid of revealing the truth in the school setting. This is in contradictory with the findings of the study conducted by Mahanta B, Mohapatra P K, Phukan N, Mahanta J[13]which has revealed that high percentage of adolescents in the industrial town of Assam use alcoholic drinks with a male preponderance. and also the study conducted by Jayakrishnan R, Geetha S, Mohanan Nair J, Thomas G, and Sebastian P[14] has shown the high prevalence of intake of alcohol among adolescent students [5.6% (95% CI 4.25–6.95)].

The second objective of the study was to assess the level of knowledge of adolescents regarding oral cancer. In the present study majority of the subjects 113 (71%) had average knowledge regarding oral cancer, 47 (29%) had poor knowledge and none had good knowledge . Of the various components of knowledge on oral cancer , the highest mean score on prevention of oral cancer (59%) and least mean score on knowledge on clinical manifestations of oral cancer (27%) is note worthy. This

poor knowledge on clinical manifestation may lead to neglect of early signs and symptoms of oral cancer resulting in diagnosis of disease in advanced stage. This has been clearly mentioned in the study conducted by Comunello IF, Bottan ER, Marín C and Subtil EM [15] that the high percentage of late diagnosis are due to population's lack of knowledge about the disease especially about the risk behaviours and precancerous conditions.

CONCLUSION

The study besides concluding the fact that the major risk behaviour of oral cancer among adolescents found was intake of smoked food, also draws our attention to the dietary trend among the rural adolescents towards grilled foods or smoked foods as majority of the subjects studied belong to rural area. Although the level of knowledge on oral cancer was found to be average, the relative poor knowledge on signs and symptoms of oral cancer needs concern.

Conflicts of Interest: Nil

Source of Funding: Nil

Ethical consideration: Permission was obtained from Institutional research committee The formal permission was obtained from the Principal, Higher Secondary School, Kerala. Assent was taken from the study subjects before commencement of the study.

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A Correlation Analysis of Factor Causing Occupational Accident with the Unsafe Behavior of Welding Workers of Division of Commercial Ships, PT. PAL Indonesia (Persero) Surabaya

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ABSTRACT

Welding activities in the shipbuilding industry PT. PAL INDONESIA (Persero) Division of Commercial Ships, containing a high hazard risk. Hazard that is not analyzed could lead to accidents. Cases of occupational accidents can result in losses. This is because there are many workers who work without PPE and not paying attention to the SOP. The general objective of this study was to analyze the factors that cause accidents on welding workers of PT. PAL INDONESIA (Persero) Division of Commercial Ships by using the approach of ILCI, Loss causation model seen from the lack of management control (lack of control), the basic causes (basic causes) and the immediate cause (immediate cause) occupational accidents are unsafe behavior (unsafe act).

This study was an observational study with cross sectional approach that was conducted in February-March 2017 to 72 out of 87 welding workers on a commercial ship division. Selection of respondents were taken by simple random sampling method. The data obtained were collected from questionnaires, interviews and observation. Data were analyzed descriptively and described in narrative form and cross tabulation.

Result obtained based on the fisher exact correlation analysis demonstrated that there is a correlation between the policy of K3, the training of K3 and SOP with the individual commitment. Individual commitments linked to unsafe behavior.

Keywords: *Accidents, unsafe behavior, welding workers*

INTRODUCTION

Implementation of safety in every workplace as mandated by Law No. 1 of 1970 and Law No. 13 of 2003 on employment, the duty of employers to protect workers from potential hazards faced. All to create working conditions that are safe, healthy, free of accidents conditions and occupational diseases1.

In general, the direct cause of the (immediate cause) occupational accidents are unsafe behavior (unsafe act) and unsafe working conditions (unsafe conditions). Based on several studies described that many workplace accidents occur due to unsafe behavior. This is supported by the results of research on the NCS (National Safety Council) on the causes of accidents. NCS research results indicate that the causes of accidents 88% is their unsafe behavior, 10% due to the unsafe condition and 2% did not know the cause. Another study conducted by DuPont Company showed that 95% of workplace accidents are caused by unsafe behavior and 4% are caused by unsafe action.Penyebab directly preceded by the basic causes (basic cause). The basic cause must be identified as highly effective in preventing the occurrence of kerugian2.

The basic cause may help explain why the loss. The basic cause may help explain why the unsafe act and unsafe condition3.Penyebab basis accidents are categorized into two, namely the occupational factors

and personal factors. Personal factors consist of lack of knowledge, skill, motivation, setress and inability to cope with stress, while the employment factor consists of the leadership, equipment and tools tidaksesuai, ergonomics and design of work stations as well as errors in using peralatan4.

A series of events and processes that lead to accidents and loss of control or monitoring indicates that less controllable management (lack of control). The theory of loss causation model of the Bird and Germain modifying Domino Theory Heinrich to put forward the theory of management that is less controllable (lack of control), the basic causes (basic cause), the immediate cause (immediate cause), contacts and accident (incident) and loss (loss)5.

Based on research by the world body of the International Labor Organization (ILO) (1989) concludes that every day an average of 6,000 people died, this is equivalent to one person every 15 minutes, or 2.2 million people per year due to sickness or an accident that relate to their work. According to the ILO in 2013 estimated 337 million occupational accidents each year and 2.3 million work-related deaths occurred. The number of men who died two times more than women, because they are more likely to do dangerous work. Overall, accidents in the workplace has killed 350,000 people6.

According to the Social Security Agency (BPJS) registering employment throughout the year 2013 the number of participants who had an accident as much as 129 911 people, and of these 75.8% were male. The number of such accidents mostly occur or approximately 65.59% in the company when they work, while outside the company as much as 10.26% and the rest, or about 20.15% were traffic accidents suffered by workers. A total of 32, 12% of workers not wearing safety equipment. Furthermore, 51.3% of causes of accidents due to collision, while the body most exposed to injury is the finger then the foot. Most injury causation of 32.25% was machinery. Number of accident insurance claims to be paid to the participants during 2013 reached 618.49 billion rupiah7.

According to research conducted by Sulfikar (2015) explains that the cases of occupational accidents in unloading dock workers during the past two years emeralds are still quite high. The number of cases of occupational accidents occurred 62 times, resulting in two people died, 18 people were seriously injured, and 42 people were slightly injured. Workplace accidents every year will result in many losses for both the company and the tenant services workers unloading. In this Jamrud Pier in 2013 never happened a fatality incident which left one person killed by falls from height during the process of loading and unloading caused by Unsafe Action8.

Based on work accident reporting data obtained from the management of K3 PT. PAL INDONESIA (Persero) Surabaya, Division of Commercial Ships, known cases of accidents to personnel during the last 2 years (2014-2015) is still quite high. The number of accidents occurred in 2014, as many as eight cases with severe injury category. Then in 2015 the increase in the incidence of accidents with 19 cases of accidents and serious injuries which resulted in 90% due to unsafe action. Therefore, this study aimed to analyze the relationship between causes of accidents with unsafe behavior on welding worker PT. PAL INDONESIA (Persero) Surabaya, Division of Commercial Ships using Ilci then analyzed by Fisher exact test.

MATERIAL AND METHOD

Participant

This research be an observational study with cross sectional design and implemented during the first month ie March to April 2017, located in PT. PAL INDONESIA (Persero) Surabaya, Division of Commercial Ships.

The population in this study were all workers welding PT. PAL INDONESIA (Persero) Surabaya, Division of Commercial Ships. Sampling in this study using simple random sampling technique, totaling 72 workers welding. The data collection technique using questionnaire and observation checklist sheet.

Procedures

The first step to doing this study is to pengumpulam primary data obtained by asking permission to the company management, then followed by asking respondents willingness welding selected as the sample for the respondent. A questionnaire/ assessment questionnaires workers against the company policy K3, K3 and SOP training, individual commitment, and unsafe behavior, then given to the respondent to be completed. After filling out the questionnaire followed by observation in the workplace with the aim to find

out firsthand how the work process and work behavior among respondents of welding workers.

DATA ANALYSIS

In this study, to analyze the relationship between the causes of accidents with unsafe behavior on welding worker PT. PAL INDONESIA (Persero) Surabaya, Division of Commercial Ships by using fisher exact test. Factors causes of accidents with unsafe behavior on welding worker is influenced by many factors including the policies of K3, the training of K3, SOP, individual commitment, do not comply with the SOP of welding.

FINDINGS

1. The correlation of K3 policy with Individual Commitment

Of the 72 worker's it is known to the majority of workers welding has less votes on policy K3 in the workplace. This is explained by the percentage value of 92.3%, which means that according to the policy if the workers vote K3 is less then the commitment of individual workers are also less, it is shown by the percentage value of 55.0%. Fisher's Exact test results obtained by value p-value of 0.001. It shows a significant relationship between policy K3 with individual commitment.

K3 policy is an important requirement in the implementation of K3 management system in the organization. K3 policy is a clear form of management commitment to K3 are set forth in a written statement. Rate respondents about K3 good policy does not increase individual commitment. This can happen because the K3 in the company policy is a form of management's commitment to the implementation of K3 in the company. K3 policy is not a form of worker commitment to organisation9.

K3 related management commitment must be shown obviously in activities and everyday attitudes contained in each policy organization. Management must support the success of K3 by showing commitment can be seen (visible commitment) and felt by all elements of the organization. Commitment is crucial as a reference and guide for all parties in implementing K3 in the organization. Therefore, companies should immediately conduct socialization of written policy10.

2. The correlation of K3 training with Individual Commitment

Of the 72 worker's it is known to the majority of workers welding has less of K3 training assessment in the workplace. This is explained by the percentage value of 90.3%, which means that according to the judgment K3 training workers in the company is less, but the commitment of individual workers is good, it is indicated by the percentage value of 70.0%. The results obtained by Fisher's Exact test obtained p-value of 0.000. It shows a significant relationship between the training of K3 with the individual commitment.

Individual commitments may develop as the organization provide something of value that can not be replied back. Moreover, since there are psychological contract (the trust of all parties that there would be reciprocal) between members of the organization. Training K3 is something valuable that can be given by the organization to its employees and cannot be replied back by the workers11.

Therefore, companies need to implement periodic K3 training and labor-encompassing old and new, it is intended to update the knowledge and understanding of the implementation of the program on the issues - the latest K3 issue that is being experienced by the company.

3. The correlation of SOP with Individual Commitment

Of the 72 worker's it is known to the majority of workers welding has less votes of SOP in the workplace. This is explained by the percentage value of 90.5%, which means that in the opinion of workers in the company SOP less, but the commitment of individual workers is good, it is indicated by the percentage value of 77.8%. The results obtained by Fisher's Exact test p-value of 0.000. It shows a significant relationship between the SOP with individual commitment.

By performing the application of SOP organization can ensure an operation run in accordance with the existing procedures and if SOP implemented correctly, then the organization will gain many benefits from the implementation of the SOP. SOP plays an important role in meeting labor standards that exist in the organization. The better the performance of workers, hence further reducing the risk of unsafe behavior that can create the scene of the accident and unsafe working conditions12.

Therefore, in the company SOPs should be reviewed periodically and communicated to each unit of work,

because there are many workers who have not quite understand the function and usability of the SOP that has been made by the company.

4. Individual commitment

Of the 72 worker's it is known to the majority of workers welding has less votes on the commitment of individuals in the workplace. This is indicated by the percentage value of 83.1%, which means that according to the judgment of individual commitments workers working less, but the behavior of workers is safe, it is indicated by the percentage value of 76.9%. The results obtained by Fisher's Exact test p-value of 0.000. Hasilinimenunjukkan a significant relationship between individual commitment to unsafe behavior of workers.

Individuals who have a passive individual commitments will allow only state that did not go well. Workers who have committed individual with such circumstances, we can just leave the unsafe behavior, either by himself or done by others around them. This shows that the majority of its respondents had a passive individual commitments that would tend to leave the safety behavior13.

CONCLUSION

1. There is a correlation between lack of control (policy, training K3, SOP) with individual commitment. The better the workers vote on policy K3, K3 training and SOP indicate they will also have good individual commitments.

2. There is a relationship between basic factor causes (individual commitments) with the unsafe behavior. The better the assessment of workers on individual commitment, then indicate workers to behave safely.

Conflict of Interest: None

Source of Funding: Department Of Occupational Health and Safety, Airlangga University, Surabaya, Indonesia.

Ethical Clearance : The study was approved by the institutional Ethical Board of the Public Health, Airlangga University.

All subjects were fully informed about the procedures and objectives of this study and each subject prior to the study signed an informed consent form.

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Legal Aspects of Emergency Medical Services Department of Wahidin Sudirohusodo Hospital, Makassar Indonesia

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ABSTRACT

This study aimed to analyze the legal aspects of health services at the emergency unit of dr.Wahidin Sudirohusodo Hospital in Makassar, Indonesia. This type of research was a survey with descriptive design to obtain an overview of the competence of the hospital to provide health services, service without a down payment, the right to claim damages, refusal of medical action and the provision of information. The research was a quantitative research and supported by qualitative data. Samples were obtained by accidental sampling method.

The result of the research showed that the ability of health care conducted by the hospital showed: 98.6% of the respondents said enough, 1.4% said less. On the service without down payment: 97.3% of the respondents didn't pay the down payment (suitable with Article 32 of Health ActNo.36 of 2009), whereas 2.7% pay the down payment. 86.5% of respondents said they would demand compensation of health workers in case of malpractice or long-life disability, 13.5% did not want to sue health care. The denial of medical treatment, 89.2 % of respondents would deny that there was an agreement/consensus in medical intervention such as in article 56 of Health Act No.36 of 2009. 10.8% did not refuse medical treatment on provision of information. 97.3% of the respondents said enough information on the intervention for baby-delivery to the maternal mother/family of Article 56 of Medical Practice Act No. 29 of 2004.

It was suggested to the hospital in terms of facilities in Emergency Room to provide emergency room services section in accordance with Standard Operational Procedures (SOP) to avoid mistakes of action / services. The hospital should provide emergency room services in particular "quick emergency room" which would be accurate and responsive in delivering actions to the community. Health workers are expected to further enhance skills and excellent services to the patients without looking their categories and social status. It is expected that health workers would have graduated from emergency course.

***Keywords**: Legal aspects, health services, emergency services, hospital*

INTRODUCTION

In principle, health care is very important for the country as it involves the degree of livelihood of the people so that it shall be controlled by the state [1]. This is in line as stipulated in the Act of 1945 *(Undang-Undang Dasar 1945)*, Article 28H paragraph 1, of the right to life and physical prosperous, residence, and obtain a good living environment and health, the right to obtain health services [2]. Health has even become the Universal Human Rights [3-5]. The Universal Declaration of Human Rights stated "…the highest attainable standard of health as a fundamental right of every human being". Every citizen has the right to health including access to acceptable and affordable health care of appropriate quality[5-9].

Hospital is one of the subsystems of health care that carries two types of services to the public, namely health care and administrative services [10, 11]. The health services include medical services, medical support services, medical rehabilitation and nursing services. These services are carried out through the emergency department, outpatient department and inpatient unit. Hospital initially only provide curative services oriented towards patients through hospitalization. However, the current hospital services then shifted due to the

advances of science, especially medical technology, income generation and education. Hospital services are currently not only curative but also be rehabilitative. Both are carried out in an integrated manner in health promotion and prevention efforts [12].

Hospitals as service provider become the "crucible" for health personnel in carrying out their profession, such as doctors, dentists, pharmacists, nurses, midwives, nutritionists, physiotherapists, and experts of medical records. Each of these health workers has an ethical profession to be practiced by the members for providing services. Health workers should understand the ethics of their profession as a guideline to act and to avoid conflicts with patients as well as among health personnel.

Various problems of ethics and law still occur in hospitals for example, patients do not know their rights regarding health care should they gain, the patients do not know the Standard Operational Procedure (SOP) given by health workers, patients do not know what kind of action is given, patients do not know the cost of services provided. In principle, patients do not obtain the service information that should be obtained. Whereas Act No. 44 Year 2009 (Undang-Undang) on Hospital Article 32 on the rights of patients which contain for example: a patient obtains information regarding the rules and regulations, to obtain information about the rights and obligations of patients, to obtain quality of health services in accordance with professional standards and SOP, even patients can choose the doctor and nursing class in accordance with their willingness and regulations in force in the hospital, as well as to get the privacy and confidentiality of the illness, including medical data.

The consequence of ignorance of the patient's rights as one of the legal aspects in health care, the health care providers can provide services to patients or actions that should not be done, the increasing burden of health costs that must be paid patients and even doctors could potentially for malpractice.

Several researches have been conducted in Indonesia relating to the rights and protection of patients. Siregar, Budhiartie [13] examined the protection of the law on the rights of patients in therapeutic transaction. This study emphasized that the transaction therapeutic is an engagement relationship between doctors and patients that have broad implications in the legal aspects. As a legal relationship then the rights and obligations of the parties is an element that can not be separated from the concept of therapeutic transaction. In contrast to the engagement in general that have a similarity in position, the transaction therapeutic imbalance position of the parties is often the case for their knowledge and understanding of the engagement objects.

Gunnara [14] expressed the number of cases of "negligence or medical errors" and patients who have not obtained their rights in medical care is a crucial issue today. This study showed 1) The policy of medical services has been the protection of patients' rights, 2) a policy of medical services has been set up "negligence or medical errors", but not thoroughly, 3) medical personnel have not fully implement the policy of medical services, 4) efforts to protect the rights of patients in hospital has been implemented in accordance with the policies, 5) medical service policy has not been fully implemented so that policy objectives have not been achieved. "Gross negligence or medical errors" and the patient have not earned the right medical care.

Pradana [15] examined the factors that cause the occurrence of malpractice by doctors and determine the legal protection of victims of medical malpractice. Studies conducted in Polrestabes Makassar City (Police office) and Ibn Sina Hospital of Makassar indicates the cause of the malpractice caused by three factors: professional standards, Standard Operating Procedures (SOP) and negligence.

However, research on the legal aspects of health care in hospitals, especially in the emergency unit at the hospital has not been much discussed, let alone a hospital where the study was conducted is a referral hospital especially in eastern Indonesia. Of course, expectations for patient protection and fulfillment of the rights of health care are guaranteed.

The aim of this study is to examine the legal aspect of health services in dr. Wahidin Sudirohusodo Hospital of Makassar, Indonesia.

MATERIALS AND METHODS

This research was conducted in Emergency Unit of General Hospital dr. Wahidin Sudirohusodo Makassar. This hospital is a central referral hospital, especially in Eastern Indonesia. This study was conducted in the emergency department because: the first action was

performed by the health worker, the interaction between the patient and the patient's family with the doctor was more done in this unit compared to the treatment room, the approval of the medical action between the patient and the doctor was then carried out in this unit.

The type of this research is descriptive survey research. Sample of 74 patients was selected by accidental sampling. In-depth interviews were also conducted on the patient or patient's family for further information. Data collection used questionnaire. Data were analyzed descriptive.

RESULTS

Respondents characteristics

The characteristics of respondents of this research describe age group (years) and education level as seen in Table 1. The number of respondents are almost scattered in all age groups with the average level of education is mostly high school.

Table 1: Respondents characteristics

Respondents characteristics	N =74	%
Age group		
10 – 19 years	14	18,92
20 – 29 years	10	13,51
30 – 39 years	11	14,86
40 – 49 years	15	20,27
50 - 59 years	15	20,27
> 59 years	9	12,16
Education level		
Elementary School	18	24,32
Junior High School	14	18,92
Senior High School	27	36,47
Diploma	3	4,05
Bachelor (Sarjana)	12	16,22

Dimensions of legal aspects of health services

These dimensions encompass competence of health personnel, services payment, right of medical treatment, and information as shown Table 2.

Table 2: Distribution of respondents according to dimensions of legal aspects of health services

No.	Dimensions	N =74	%
1	Competence of health personnel		
	Enough	73	98.6
	Less	1	1.4
2	Services		
	Without a Down Payment	72	97.3
	With a Down Payment	2	2.7
3	The right for compensation		
	Claim	64	86,5
	Unclaim	10	13,5
4	Refusal of medical treatment		
	Refuse the medical intervention	66	89,2
	Take the medical intervention	8	10,8
5	Giving information		
	Enough	72	97.3
	Less	2	2.7

Table 2 shows that respondents who expressed enough competence of health personnel in the emergency room were 73 people (98.6%), whereas respondents who stated less competence to perform health services were 1 person (1.4%). Mostly they expressed health services without a down payment (97.3%). Respondents stated that they will demand the right to claim for compensation (86.5%) and 13.5% didn't claim for the compensation. furthermore, the table also shows that 89.2% respondents expressed to refuse medical treatment and 10.8% take the medical intervention. Around 97.3% respondents expressed that they have sufficient in the provision of information and 2.7% less information. This data shows that although this hospital is a referral centre for health services, the hospital still needs to improve the health service quality to meet the patients' needs.

DISCUSSION

The competence of the hospital to provide health service

The competence of the hospital to provide health service refers to the availability of medical equipment, medical support, medicines, laboratory, pharmacy, doctors and nurses at the emergency room when the patients come the emergency room to find help so that it

can save their lives and to avoid disability.

Based on Permenkes No. 340/2010 on classification of hospital, article 6, paragraph 1; hospital class A should have four (4) basic specialist medical services, 5 (five) medical support specialist services, twelve (12) other specialist medical services, and 13 (thirteen) sub specialist medical service. To provide comprehensive health service and referral-system, to fulfill the need and the safety of the patient with high quality and affordable by all community.

There are three groups who direclty involved in health services management i.e.,

health providers, such as doctors, nurses; consumers and, administrators (from the company, government and others). There are still other groups indirectly involve to determine the health services management i.e., community as a whole, or the families of patients. The special characteristic of the health care is that both health providers and consumers rarely consider the cost, as long as they can be cured. The health providers will always be urged to use their competence, technology and the latest medicine so that they will provide safety as a part of moral responsibility to cure a patient. The fact is also supported by the need of a consumer to get a better service, and the feeling of safety [16].

Service without a down payment

Health Law No. 36 of 2009 has obligated the health care facilities to prioritize efforts to save the patient. In Article 32 paragraph (1) states that in the case of emergency, health care facilities, both public and private, is required to provide health services to save the lives of patients and the prevention of mental disability.

In law no 44 / 2009 on hospital, article 29 paragraph (1) letter f stated that the hospital should perform as a social function, such as providing health facilities to the poor patients, providing emergency room without down-payment, providing free ambulance, and providing service to the victim of disasters and any other extra ordinary cases as well as social service for the humanity.

In the past, poor patients or the victims of war wiould are kindly-treated by doctors and nurses. They received medical services or treatment with free of charge. However,

The right to claim compensation

The law No. 36 of 2009 Article 58 paragraph (1) stated that every person is entitled to claim compensation if the health personnel or the health provider do the malpractice in the health care. Article 1365 of the Civil Code stated that any unlawful action and bring harm to others, then that person causing the loss should replace those losses.

One example was: a patient Sudirohusodo Wahidin Hospital reported a cardiologist to police. The cardiologist attached a ring to the patient's heart, but his heart was actually not in trouble. It was experienced by RS (42). He claimed that two paired- rings (stent) were installed at the heart blood vessels on April 30, 2010. The installation was as recommended by the AA which was a cardiologist at the Hospital Wahidin Sudirohusodo Makassar. Based on the example, the patient or the patient's family can sue the health workers for reimbursement of the treatment (the maximum penalty compensation costs, as well as send to prison (jail).

Refusal of medical action

The definition of the refusal of medical treatment happens due to no agreement of both parties between patients and doctors in making medical intervention, or the patients are children, the patients are insane, therefore they can't bear the responsibility based on the legal action.

Provision of Information

The information could be related to drug information [17], operation action [18]. Providing information is not just responsibility of a doctor but also a nurse. Another problem also is that perhaps doctors or nurses provide information but misunderstandings with patients due to language problems. Some patients come from outside the city of Makassar, where some patients do not understand about the drug given

Health personnel should use language that is clear and true, and easily understood by the patient or the patient's family. If it is possible then the health workers should speak local language.

CONCLUSION

This study concludes that the legal aspects of health services such as competence of health personnel, health

services, righ for compensasion, refusal of medical treatment and right to information are enough at the emergency unit of dr.Wahidin Sudirohusodo Hospital in Makassar, Indonesia. Although some aspects still need to be strengthened such as those relating to information on drug indications.

It was suggested to the hospital in terms of facilities in Emergency Room to provide emergency room services section in accordance with Standard Operational Procedures (SOP) to avoid mistakes of action / services. The hospital should provide emergency room services in particular "quick emergency room" which would be accurate and responsive in delivering actions to the community. Health workers are expected to further enhance skills and excellent services to the patients without looking their categories and social status.

Ethical Clearance- Taken from ethical committe/ research letter from Institute of Health Science of Tamalate (STIK Tamalatea), Makassar Indonesia

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Conflict of Interest – Nil

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Comparative Evaluation of PPIUCD Insertion in Post Placental Vs within 48 Hours of Delivery

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ABSTRACT

Introduction: India is the second most populous country in the world after china. It has 16% of the world's population being supported by 2.5% of the land area only. For most women, getting an institutional delivery is the only time when a woman gets an opportunity to visit a health set up. Offering family planning could prevent many future unintended pregnancy.

Aims and objectives: The continuation rateand problems PPIUCD insertion in post placental vs within 48 hours od delivery

Method and Matreial : A Prospective study which was conducted in the Department of Obstetrics and Gynaecology, Subharti Medical College, Meerut, to compare Acceptability, Safety and Continuation rate of Copper T 380A during immediate post placental insertion vs. Insertion within 48 hours of delivery.

All women attending antenatal OPD and emergency clinic, in early labour and in post natal wards were counselled about the benefits of child birth spacing, small family and various options for immediate post-partum contraception were explained by cafeteria approach. The first 100 women who opted for immediate post placental IUCD insertion were included in Group A and the first 100 women who opted for post-partum IUCD within 48hrs were included in Group B.

Post placental insertion was done by using Kelly's forceps by standard technique.

Results: The continuation rate was 96% at the end of 6 months of study. At each follow up visit, 22.5% women have reported pain in lower abdomen, 0.5% vaginal discharge, and irritation due to strings, personal problems, menstrual irregularities in 2%, weakness and thread coming out of vagina. visibility of strings was seen in 90% case by the end of study.They were examined and treated accordingly. Failure of contraception was reported in 1 patient. There was no case of perforation.

Conclusion: The PPIUCD is a safe method of contraception in immediate post placental insertion.The pain experienced by a women due to CuT380A is camouflaged with the after pains and hence leads to higher acceptance of the PPIUCD device. The PPIUCD does not cause menstural irregularities as the women is in lactationalamennorhoea.The main reason behind removal of CuT 380A was partial expulsion of the IUCD.

Keyword : *PPIUCD, CuT 380A, and Contraception.*

INTRODUCTION

"Family Planning could bring more benefits to more people at less cost than any other single technology now available to the human race" James Grant, UNICEF , 1992.

India is the second most populous country in the world after china. It has 16% of the world's population being supported by 2.5% of the land area only. According to the 2011 census, the total population of India is 121 crore and is projected to reach 1.53 billion by 2050, making it the most populous country in the world. Women of reproductive age group (15-49years) make up approximately 248 million. The reproductive and child

health (RCH) program in india promotes responsible and planned parenthood through the government's family welfare programme with voluntary use and free choice of contraceptive methods.

"UNMET NEED FOR family planning," which refers to the condition of want-ing to avoid or postpone childbearing but not using any method of contra-ception, has been a core concept in the international population field for more than three decades[6]. Under the label "KAP-gap," for knowledge, atti-tudes, and practice regarding family planning, the concept had its origins in the first fertility and family planning surveys carried out during the 1960s[6].

The lack of contraceptive awareness, myths about various methods, unwillingness of husband and older family members to contraception has resulted in lesser use of these methods.

Intra uterine contraceptive device is one of the most commonly used reversible method of contraception among married women of reproductive age worldwide.

Results of recent studies and literature have confirmed that IUCDs provide very effective, safe and long term protection against pregnancy , the health risk associated with the method are negligible too .

The Millennium Development Goal (MDG) aims at providing quality contraceptive service as its cornerstone. One of the immidiate objectives of the national population policy is to address unmet need of contraception.

The Government of India introduced CuT380A in 2002 with the effective protection for 10 years replacing the earlier CuT 200. But yet the acceptance of IUCD continues to remain below 2%, out of the total couple protection rate of 48.5% for the use of any modern contraceptive method(NHFS-3) One of the objectives of national population policy 2000 is to address the unmet needs for contraception. Achieving population stabilization, gender and demographic balance though universal access to equitable, affordable and quality health care, this is responsive to the needs of the people if the objective of the national rural health mission and RCH II launched in 2005.

Lack of patient's education, non availability of accessible family planning services and restricted women's mobility due to cultural or geographical factors are among the most important factors resulting in low contraceptive acceptance. In most of the cases, getting an institutional delivery is the only time when a woman gets an opportunity to visit a health set up. Offering family planning could prevent many future unintended pregnancy[4].

MATERIAL & METHOD

A Prospective study which was conducted in the Department of Obs. & Gynae., Subharti Medical College, Meerut.

- **A Prospective study which was conducted in the Department of Obs. & Gynae., Subharti Medical College, Meerut.**
- All women
  - o attending antenatal OPD
  - o emergency clinic
  - o in early labour
  - o post natal wards
- Were counselled about the benefits of
  - o child birth spacing
  - o small family

Various options for immediate post-partum contraception - cafeteria approach.

STUDY GROUPS-

• Group A

100 Women who have received Copper-T 380A insertion immediately after expulsion of placenta (immediate post placental insertion)

• Group B

100 women who could not be inserted IUCD just after delivery & got it within 48 hours of delivery due to -

- lack of opportunity for counselling
- indecisiveness about contraceptive method
- wanted to consult some specific family member or other non-specific

TECHNIQUE-

Insertion was done by using Kelly's forceps by standard technique.

INCLUSION CRITERIA-

- Women –

- willing to get IUCD insertion in immediate postpartum period (post placental, 48hrs of delivery)
- willing to return for follow up visits.
- not having any contraindication of IUD insertion (WHO MEC category 1 or 2).
- having previous menstrual cycles regular for at least 6 months before the current pregnancy

EXCLUSION CRITERIA-

Diagnosed at antenatal time:

- Large Fibroid uterus (distorting uterine cavity)
- Congenital uterine anomalies
- Allergy to copper
- Severe anaemia (< 6 gm%)
- Uncontrolled diabetes mellitus
- Any bleeding disorder

During delivery:

- Prolonged Rupture of Membranes (>18 hrs)
- Fever or any other signs of chorioamnionitis.
- Unresolved postpartum haemorrhage

RESULTS

Table 1: Mode of delivery, Distribution of group, p value

VARIABLES		GROUP A (IMMEDIATE POST PLACENTAL)	GROUP B (WITHIN 48 HRS OF DELIVERY)	TOTAL	CHI-SQUARE VALUE	P-VALUE
1.	NORMAL VAGINAL	83	17	100	13.09	0.0003
2.	L.S.C.S	98	2	100		

Table 2: Problems of CuT380 A at 6 weeks, 3 months, 6 months of follow up

Group A			Group B			
	6 weeks	3 months	6 months	6 weeks	3 months	6 months
Visibility of strings	32	65	87	40	89	93
Pain	14	5	1	18	7	0
Expulsion	0	1	2	0	1	1
Discharge	0	0	0	1	0	0
Spotting P/v or irregular bleeding	0	1	1	0	2	0
Pregnancy	0	1	0	0	0	0

Table 3: Removal of CuT380 A at 6 weeks, 3 months, 6 months of followup

	6 weeks	3 months	6months
Group A	0	2	2
Group B	0	3	1

Table 4 Reason for removal of CuT 380A

Reason for wanting removal of CuT 380A	GROUP A			GROUP B		
	6 weeks	3 months	6 months	6 weeks	3 months	6 months
Pain lower abdomen	0	0	0	0	1	0
IUCD failure/ Pregnancy	0	1	0	0	0	0
Pelvic infection	0	0	0	0	0	0
Partial expulsion	0	1	2	0	1	1
Bleeding/ Spotting per vaginum	0	0	0	0	0	0
Uncomfortable to husband	0	0	0	0	1	0

OBSERVATIONS

The major findings of the study were as follows:- In our study mean age of women in each group were 26.5.

Both the groups A and B were comparable to each other with respect to low- socio-demographic profile 53%and 49%. respectvely It was seen that irrespective of the level of education in each group, with proper counselling and logical reasoning of family planning, the women were ready to accept IUCD as a choice of contraception.

High awareness about contraception was seen in both the groups, but there was lack of right information and knowledge which in turn lead to the decrease usage of various methods. Both literate and illiterate couples have a high unmet need for contraception as there are myths and misconceptions about IUCD.

Our study showed that counselling and improvement of contraceptive knowledge has the potential to positively impact the myths, negative beliefs and misconceptions regarding contraception, which discourage contraceptive use. Hence increasing knowledge would increase the patient's contraceptive use.

Even today women in teen age group are getting pregnant and are not aware about the risk of getting pregnant in teenage. There is a need to provide contraceptive awareness to teenage girls by premarital counselling or counselling at first available opportunity after marriage to increase marriage-pregnancy interval.

Relatives, friends and television were found to be the most important source of awareness amongst the users in both group A & B.

More is the delivery and IUCD insertion interval more expertise in insertion technique is required.

The thread of CuT 380A is visible in 36% patients in the first vist. By the end last visit Cu T 380A string was visible in 90% patients in the study as shown in table 2

Expulsion was seen in 6% patients, expulsions are basically found after 6 weeks of IUCD insertion as more expulsions are seen after 6 weeks.

The pain experienced by a women due to CuT380A is camouflaged with the after pains and hence leads to higher acceptance of the PPIUCD device.

The PPIUCD does not cause meantural irregularities as the women is in lactational amennorhoea.

The main reason behind removal of CuT 380A was partial expulsion of the device.

With proper training and practice PPIUCD insertion is easy in both the groups, IUCD insertion but was slightly painful in group with insertion within 48hrs of delivery.

In immediate PPIUCD group, during follow up visits, lower abdomen pain was the most common problem encountered by IUD users. Only few women

required medication and bleeding complaints.

DISCUSSION

in the Indian public health system, it is important to understand whether the nurses and midwives who conduct most deliveries are able to provide PPIUCD services as safely and effectively as physicians. This case–control study demonstrates that two key negative outcomes only6% expulsion and none of case was associated with infection. .

These results suggest that task sharing, that is, allowing nurses and midwives to take on tasks previously limited to physicians, is a safe and effective way to address the shortage of health workers. Shortage of health workers is a key constraint on access to FP services globally and to postpartum FP services, especially the PPIUCD, in India[5] Allowing nurses to insert PPIUCDs also has the potential to increase acceptance of the method, as found by a study done in Turkey and in the Philippines[6]. Acceptance increased because nurses were more accessible and acceptable to clients than were physicians. A study in Zambia demonstrated the success of a program in expanding access to IUCD and implant services by competent midwives; after 14 dedicated midwives were made competent in IUCD insertions, acceptance of the IUCD at their busy clinics increased compared to other long-acting, reversible contraceptiv[7]. IUCD prevalence has been shown to increase by more than two fold when nurses were allowed to perform insertions as a matter of policy in Turkey[8]. The study conducted in Turkey and in the Philippines also showed that client follow-up is improved when IUCD insertions are performed by nurses [6].

Competency-based training and posttraining support to enhance providers' proficiency are critical for providing good-quality PPIUCD services because the likelihood of expulsion depends on the technique of insertion. The fundal placement of the IUCD using correct technique reduces the chances of expulsion [9],[10]. Unexpectedly, our analysis found that the training approach was significantly associated with both expulsion and infection — but in opposite directions for the two outcomes. Expulsions were less likely, but infections were more likely, when providers had received centralized training rather than onsite or on-the-job training, even though the content of the training was standardized across all the training modalities. Poorer expulsion outcomes for providers who attended onsite and on-the-job training might be due to the inadequate number of clients available for supervised insertions at the peripheral health centers where these trainings are held. At tertiary facilities where centralized trainings are held, higher caseload ensures an adequate number of clients desiring PPIUCD insertions during training. In contrast, onsite and on-the-job training permits demonstration of infection prevention practices to providers in their own facility setting, catalyzing continuation of newly learned practices. We cannot draw conclusions about the effectiveness of different types of training in minimizing adverse outcomes in PPIUCD insertions because it was not the subject of this study. However, the findings suggest that further research is needed to explore this issue.

There are some limitations on the interpretation of the study findings. Although individual providers could have performed more than one insertion included in the dataset and this can shift the ORs in either direction, it was impossible to adjust for provider-level clustering of observations because the records did not include a provider identification number or standardized provider name. In addition, information on providers' experience with FP and PPIUCD insertion was frequently missing, and certain variables that are known to affect the likelihood of expulsion or infection, like preexisting medical conditions, were not recorded in the service registers.

In conclusion, the results of this study show that training nurses and midwives who conduct deliveries to insert IUCDs during the postpartum period has the potential to increase women's access to PPIUCD services at public health facilities without jeopardizing the quality

CONCLUSION

This pioneer study was conducted with the primary aim to study "Acceptibility, Safety And Continuation Rate Of Copper T 380a During Immediate Post Placental Insertion Vs Insertion Within 48 Hours Of Delivery" by comparing various parameters related to socio demographic profile, ease of insertion by provider, complaints at the time of follow up, satisfaction of the women, expulsion rate, request for removal and continuation rate at the end of the study.

High unmet need, increased number of unintended pregnancy, various myths and misconceptions lead to low contraceptive usage amongst women and is hence a matter of concern. Availability of an effective and safe contraceptive method in the immediately post delivery with proper counselling and follow up by medical personnel has a great role in increasing acceptance, providing safety which in turn increases the percentage of continuation rate amongst women and directly reduces the unmet need for contraception. In immediate insertion, the time and place are convenient for the woman and they can be easily motivated for various spacing methods.

Compliance with ethical requirement and Conflict of interest No conflict of interest is declared. Informed consent was taken from all the patient involved in this study.

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Relationship of Benzene Exposure with Blood Profile of Shoemaker in Central of Shoes Industry Wedoro (Home Industry)

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ABSTRACT

Benzene is chemical components contained in glue which used in production of shoe and sandal that can also cause abnormality of the blood profile. Benzene exposure in the work environment is related to the individual characteristics and conditions of the environment.

The purpose of this study was to scrutinize the relationship between benzene exposure with blood profile. The study design was cross-sectional with observational research and the subjects were 15 workers. The independent variabel is benzene level in the air while the dependent variable was blood profile.

The results of benzene level measurement in the air with the maximum level was 37,1362 ppm. The average level of haemoglobin in blood was 12,667 g/dL; Eritrosit 5,1173 10^6/mm^3; Hematokrit 43,4400 %; MCV 85,1333 µm^3; MCH 24,8800 pg; MCHC 29,0800 g/dL; Leukosit 7,2400 10^3/mm^3; Trombosit 263,6 10^3/mm^3. The result of Pearson correlation found that significant relation exist between working hours (hour/day) with eritrosit (p = 0,012) and MCH (p = 0,012). Spearman rank test found that significant relation exist between benzene level in the air with MCV (p = 0,023) and MCH (p = 0,019).

Based on the result, it is necessary to consider of having gradual change of the glue, optimizing the ventilation, applying 5R principles in the workplace, providing the plantation to reduce the benzene vapor in the working environment, conducting a separated room from the working place to take some rest, and providing the workers with personal protective equipment.

Keywords: *benzene, blood profile, shoe industry, home industry.*

INTRODUCTION

The shoe industry is one of highly productive industries in Indonesia, which results on laboring 49.000 workers. In one hand, production process of hand-made shoes has been socially assumed as having the best quality outcomes. While in the other hand, it has exposure potential risk due to the plentiful workload in using glue that contains organic solvent. The glue usually contains benzene, toluene, ethyl methyl, ketone, and acetone which may harm one's health.

The benzene is a toxic air pollutant. Environmental Protection Agency (EPA) and International Agency for Research on cancer (IARC) has classified it in Group A as a chemical substance proven to be carcinogenic for human beings2. The effects of chronic benzene exposure may result on hematopoietic system detriment in bone's marrow. Symptoms of anemia, infection, and easily injured or bleeding portray the damage itself. A further effect may confirm progressively element deficiency of red-blood cell (erythrocyte).

Benzene toxicity is highly related with its metabolism process within the body. Its metabolites formed during the process are proven to be harmful as it could bring on hematopoietic and leucomogenic effects. Highest benzene absorption is occurred through inhalation; where 70-80% of benzene is absorbed in the first 5 minutes and 20-60% is for an hour later. However, oral absorption would take 98% of benzene passing through the body and 80% of benzene through the skin.

According to the research by Rothman (1996), blood profile (erythrocyte, leucocytes, hematocryte) parameter was decreased as long as the workers were exposed by benzene4. Research by Robbins and Kumar (1995) stated that benzene could cause the failure of main myeloid cells affecting in hemoglobin and erythrocyte production reduce.

The result on observation of shoemakers located in sandals and shoes industry in Wedoro showed that the place had unhealthy workplace condition with improper ventilation system, the workers did not use APD (masks), the glue's containers were always opened, and even some workers did not wear special costume while working and smoking at the same time. The workers who seemed to experience dizziness, asphyxia, and sore eyes indicated the effects of benzene exposure within their bodies.

This research aims to analyze the relations of benzene exposure towards the blood profile of gluing workers on the center of shoe and sandal industry Wedoro.

MATERIAL AND METHOD

The type of this research is observational analytic with cross sectional approach. Samples of the subjects were taken through simple random sampling technique according to arranged inclusion criteria of samples. The writers eventually obtained 15 gluing workers from 10 shoe and sandal factories in Wedoro. Object of samples is inhaled benzene within the bodies of gluing workers. Benzene's extraction employed personal dust sampler and it was scrutinized with chromatography gas with flame ionization detector (GC/FID). Blood examination was conducted through vena blood extraction as much as 2 – 3 cc which was analyzed with Micros abx 60 and Hematology analyzer method. This research was performed in September 2016.

FINDINGS

The characteristics of respondents could be described in Table 1:

Table 1. The Distribution Frequency of Respondents' Characteristics

Workers' Co		Frequency	%
	Age		
	≥ 34,5 year	8	53,3
	< 34,5 year	7	46,6

Cont... **Table 1. The Distribution Frequency of Respondents' Characteristics**

2	Length of working		
	≥ 13,5 year	6	40
	< 13,5 year	9	60
3	Body Mass Index *		
	Underweight	6	40
	Normal	7	46,6
	Overweight	3	20
4	Working hours		
	≥ 9 hour/day	4	26,2
	< 9 hour/day	11	73,3
5	Smoking habit		
	Heavy smoker	5	33,3
	Moderate smoker	3	0,2
	Light smoker	0	0
	Nonsmoker	7	46,4
6	Sport habit		
	No exercise	6	40
	Exercise	9	60

Note : *BMI (Body Mass Index) is the ratio of weight (kg) by the square of height (meters).

Environment measurement was accomplished to determine benzene level in the workplace. In the Table 2., there is the result of air quality measurement:

Table 2. Benzene level in the workplace's air

Work Location	Measurement Point	Result of Benzene Level (ppm)	
Factory A	1	1,7689	
	2	1,5045	
Factory B	3	2,1871	
	4	1,9755	
Factory C	5	3,4815	
Factory D	6	2,6673	
Factory E	7	37,1362	
Factory F	8	1,0120	
	9	4,8865	
Factory G	10	2,4279	
Factory H	11	5,5023	
Factory I	12	6,8154	
	13	6,6533	
Factory J	14	1,8155	
	15	1,7830	
Min		1,01	
Max		37,14	
Average		5,4411	

* Exceeding TVL levels of benzene according to Permenakertrans 13 / MEN / X / 2011 of 0.5 ppm.

The result showed that the entire factories indicated benzene level above the minimum threshold value (nilai ambang batas-NAB) allowed by the government written under the Regulation of the Ministry of Workforce and Transmigration of Republic of Indonesia Number PER.13/MEN/X/2011, which is 0,5 ppm.

The examination of blood profile is portrayed in Table 3 below:

Table 3. The examination result of respondents' blood profile

No	Blood profile	Average
1	Hemoglobin (g/dL)	12,67
2	Eritrocyte (10^6/mm^3)	5,12
3	Hematocrit (%)	43,4
4	MCV (μm^3)	85,13
5	MCH (pg)	24,88
6	MCHC(g/dL)	29,08
7	Leukocyte (10^3/mm^3)	7,24
8	Thrombocyte (10^3/mm^3)	263,6

The examination of workers' blood profile showed that several parameter of blood profile was lower in hemoglobin, MCV, MCH, and MCHC. A health effect caused by benzene exposure is the perturbation of hematology system because its target is bone's marrow where the blood cells are produced. Reduction of blood cells is an initiate indication to detect low stage of benzene exposure's effects. However, one has to take medical examination on his bone's marrow to acknowledge the damage level of benzene exposure's effects.

To acknowledge the relations between benzene in the air and blood profile, an analysis of statistic test using rank spearman correlation test was held. Table 4. is the result showing the relation of benzene in the air and worker's blood profile.

Table 4. Result of the test between the benzene level and blood profile

No	Variable	p- value	Result
1	Benzene level and hemoglobin	0,405	Unsignificant
2	Benzene level and eritrocyte	0,117	Unsignificant
3	Benzene level and hematocrit	0,980	Unsignificant
4	Benzene level and MCV	0,023	Significant
5	Benzene level and MCH	0,019	Significant
6	Benzene level and MCHC	0,162	Unsignificant
7	Benzene level and leukocyte	0,647	Unsignificant
8	Benzene level and Thrombocyte	0,985	Unsignificant
(α = 0,05)			

From the result of Spearman correlation test analysis, the writer concludes that there is a significant connection between benzene exposure and workers' MCV level (p score = 0,023) and MCH (p score = 0,019).

The workers who inhale benzene for a long period may experience disorder on his or her normal blood production system and blood cell reduction. It is caused by the disruption of hematopoietic or blood forming process within the marrow. A significant connection between benzene level and blood profile components is mainly emerged because of the high benzene exposure in the workplace.

High-level benzene concentration is caused by abundant usage of glue during the shoes production process. Besides, lack of air circulation due to the improper ventilation system also contributes to this. The other factor that may affect the workers as well as previous ones is inappropriate glue stockpiling; for instance, when the glue is not closed. Those mixed factors would make the benzene vapor effortlessly evaporated in a particular point; so that it could raise higher concentration of benzene in the workplace.

The result showed that benzene distracted erythropoietic within bone's marrow portrayed in examination result of erythrocyte index of the respondents. The index illustrated MCV and MCH lower level compared to the normal level the person might have. Inhaled benzene would be absorbed by alveoli membrane. The kidney, a place where erythropoietin hormone is formed, would be unbalanced that may trigger abnormality on erythrocyte's characteristics. In long term period, or in the other word the longer the worker is exposed, it benzene exposure would reduce his or her erythrocyte level and thus, the worker would suffer anemia. The process of blood production could be normalized if the benzene exposure was being stopped (NIOSH, 2003).

CONCLUSION

The benzene level in workplace of shoe industry Wedoro is above the minimum threshold value allowed by the government written under the Regulation of the Ministry of Workforce and Transmigration of Republic of Indonesia Number PER.13/MEN/X/2011

The examination result of respondents' blood profil indicates abnormalities in hemoglobin, erytrocyte, hmatocrit, MCV, MCH, MCHC, and leucosyte level. Thrombocyte level overall performed normal number.

There is correlation of benzene level in the workplaces' air with workers' MCV and MCH.

Conflict of Interest: None

Source of Funding : Departement of Occupational Health and Safety, Airlangga University, Surabaya Indonesia

Ethical Clearance: The study was approved by the institutional Ethical Board of the Public Health, Airlangga University.

All subjects were fully informed about the procedures and objectives of this study and each subject prior to the study signed an informed consent form.

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The Relationship of Lack of Control Factors with the basic Cause in Effort to Prevent Fall Risk on Hospitalized Patients in Muhammadiyah Lamongan Hospital

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ABSTRACT

The risk assessment of falling is one of the goals of patient safety program. Risk assessment of falling risk is one of the goals of patient safety program. Falling risk incident is a lack of supervise manifestation of a whole hospital's component, begin with the system to the work environment against the subjects in it.

The purpose of this study was to analyze the relationship between Lack of Control Factors (programs, surveillance, standard operating procedures, facilities and infrastructure protective equipment and safety training patients) and Basic Cause (variable exogenous) in an attempt to control falling risk faktor in hospitalized patients of Muhammadiyah Lamongan Hospital. This study was a quantitative research conducted by using cross-sectional design and the total number of respondents was 88 nurses.

The result of path analysis showed a significant relationship between programs, supervision, facilities / infrastructure of protective equipment and safety training of patient with the Basic Cause ($p = 0.000$). Whereas Standard Operating Procedure (SOP) had no significant relationship ($p = 0.170$).

This study suggested to conducting patient safety training gradually to the management and creating a culture of patient safety in hospitals.

Keywords: *Lack of Control, Basic Cause, Patient Safety*

INTRODUCTION

One of patient safety goal is to prevent the patient injury risk due to falling during hospitalization[11]. Falling incident occured frequently in hospitalized patients while undergoing treatment[4]. It was reported that there are 100 falling cases every 1000 beds every month [5].

In Indonesia, falling patients was categorized in the top 3 medical incident in Hospital. The impact of falling incident can cause lacerations, fratur, bleeding and death[4].

Referrs to the *Loss Caution Model* of Bird and Germain, it was explained that a series of events that led to the loss/accident indicated that there is lack of control factor. Falling incident prevention will be succeed if The hospital has a good management of patient safety. Lack of management control in the hospital is a variable that can affect to personal factor and job factor that is a basic cause of the risk of patient safety[3].

The problem of this study was falling patient incident in Muhammadiyah Lamongan Hospital increased in the last 3 years. Based on preliminary studies, the hospital management had several patient safety programs, but there was a lack of control in program implementation which cause increasing the number of falling patient incident every year. The results of observation also showed some of patient safety protective equipment in poor condition, lack of supervision in the work environment, and some nurses never had patient safety training.

This study aimed to analyze the relationship between Lack of Control factors (programs, supervision, standard operating procedures, facilities and infrastructure

protective equipment and safety training patients) and Basic Cause in an attempt to control falling risk faktor in hospitalized patients of Muhammadiyah Lamongan Hospital

MATERIAL AND METHOD

This study was a quantitative study conducted by using cross-sectional design study with 88 nurses as sample. The sample taken by using simple random sampling. All the sample are the nurse of 5 impatient room in Muhammdiyah Lamongan Hospital. Data collected by questionnaire that had been tested the validity of the questionnaire and interview sheet to get patient safety program data.

In addition, another instrument that supports this study was observation checklist sheet and documentation study to determine the state of the study condition objectively. All respondents will be given a direction and fill in an informed consent before the study started. Data analyzed by using path analysis with the aimed to assess the causality between the variables examined the contribution of each exogenous variables to endogenous variables.

FINDINGS

Characteristics of the variables can be described in table 1 below:

Table 1.Variable Characteristics Research

No.	Variable	Category	Result	
			n	%
characteristics of Respondents				
1	Age (Years)	min (21)	-	-
		max (49)	-	-
		mean (29)	-	-
2	Sex	male	29	33
		female	59	67
3	Education	Diploma	66	75
		S1	8	9.1
		Professional (Nurses)	14	15.9
4	Length of working (Years)	min (1)	-	-
		max (20)	-	-
		mean (5.8)	-	-

Cont... **Table 1.Variable Characteristics Research**

Lack of Control				
1	Patient Safety Program	Less	1	1.1
		Enough	40	45.5
		Good	47	53.4
2	Supervision	Less	9	10.2
		Enough	62	70.5
		Good	17	19.3
3	Standard Operational Procedure	Less	42	47.7
		Enough	67	52.3
		Good	0	0
4	Facilities and infrastructure	Less	2	2.3
		Enough	67	76.1
		Good	19	21.6
5	Patient Safety Training	Less	5	5.7
		Enough	83	94.3
		Good	0	0
Basic Cause				
1	Knowledge	Less	46	52.3
		Enough	34	36.6
		Good	8	9.1
2	Attitude	Less	2	2.3
		Enough	81	92.0
		Good	5	5.7
3	Equipment	Less	3	3.4
		Enough	75	85.2
		Good	10	11.4
4	Interpersonal relations	Less	0	0
		Enough	62	70.5
		Good	26	29.5

Data characteristics collected by interview using a questionnaire including age, gender, education and working period.

The average age range of respondent was 22-31 years old. Male was the dominant gender of all respondent. The average last education of respondent was Diploma 3. The average working period of respondent was 5.8 years.

By the lack of control, most of respondent thought that patient safety program was good enough and either facility factor. While, in supervision there was 10,2% stated tha lack of supervison by management. Most of respondent did not do SOP frequently and 5% of respondent never had patient safety training.

By the basic cause, 52% of respondent has knowledless about patient safety program that indicated of lack of supervision towards patient safety program. It was assumed that patient safety program in Muhammadiyah Lamongan Hospital done but not for supervision of the program, knowledge and action of nurses. This showed that lack of control factor significantly related to basic cause factor.

To determine the relationship between factors Lack of Control (programs, surveillance, standard operating procedures, facilities and infrastructure protective equipment and safety training patients) and Basic Cause in an attempt to control falling risk faktor in hospitalized patients, the analysis of the relationship is done by using path analysis (path analysis) that aimed to assess the causality (causation). As for the results obtained from data processing to determine the latent variables ties lack of control as following figure:

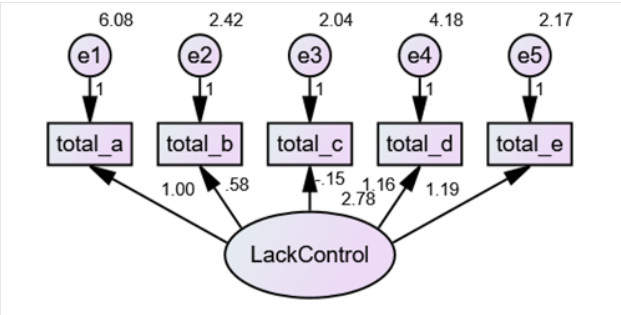

Figure 1. Path Analysis Model Lack of Control

Information:

Total_a: patient safety program

Total_b Oversight

Total_c: Standard Operating Procedure (SOP)

Total_d: Infrastructures

Total_e: Patient Safety Training

The relationship between variables in the model image significantly on the path analysis above can be viewed from the following table:

Table 2. Variable Factor Analysis Lack of Control by Basic Cause in RS Muhammadiyah Lamongan Year 2017

Relationships between variables of lack of control	Value		Information
	estimate	*P*	
Patient Safety Program	1,000	0,000	Significant
Supervision	0.583	0,000	Significant
Standard Operating Procedure (SOP)	- 0.148	.170	Not significant
Provision of Personal Protective Equipment Support & Facility Patient Safety	1,159	0,000	Significant
Patient Safety Training	1,194	0,000	Significant

Table 2 showed that the relationship between the of a lack of control variable: Patient Safety Program, Supervision, Provisioning Support & Facility Protective Equipment of Patient Safety and Training Patient Safety had a significant relationship with basic cause variable p = 0.000. While the Standard Operating Procedure (SOP) had no significant relationship with basic cause variables.

Patient Safety Program

Patient safety program factors in this study proved that have a positive contribution and significant in path relation, P = 0.000, which means there was a relationship between patient safety programs and basic cause. This means that patient safety aspect of work program runned by managemenet had causal relationship toward basic cause.

Other study by Bawelle (2013) showed that there was a relationship between patient safety and basic cause which data analysis showed there was a significant relationship between patient safety and nurses knowledge level p=0,014 and also significant relationship between patient safety program and nurse's attitude p=0,000. Knowledge is an important factor to make decision but knowledgement of someone not always can avoid unwanted incident. As example, the nurse that has good

knowledge does not mean they do patient safety program correctly because every action has a risk to be incident[3].

Supervision

Patient safety supervision factor proved that had positive contribution and significant relationship to path analysis p=0,000 which means there was a significant relationship between patient safety supervision and basic cause. This means patient safety aspects done by by management had causal relationship toward basic cause. Other study by Helendina (2015) showed that there was relationship between supervision and nurse attitude p=0,015. Based on study the supervision had strong affect to someone behavior because a behavior started by cognitive domain which was the individu recognized the stimulus object that could be knowledge and the next level is affective domain which was mental respon of attitude towards object and last in psikomotor domain as action [6]. Bird and Germain (1992) in his book Practical Loss Control Leadership stated that the supervision is a factor that causes basic cause [3].

Standard Operating Procedure

Most of respondent thought SOP made by management was good. Path analysis showed that there was no significant relationship betweet SOP and basic cause. SOP variabel was homogeny which every nurse doing the same SOP that cause statistic analysis test showed there was no significat relationship between SOP and basic cause. Other stude by Ratnawati (2009) showed that there was no significant relationship between SOP and knowledge level of nurse p=0,406. Two of ten respondents said did not know about SOP [10].

Provision of Personal Protective Equipment Support & Patient Safety Facility

Provision of personal protective equipment support & patient safety facility in this study proved that had positive contribution and significant in path analysis p-0,000 which means there was a significant relationship between patient safety equipment and basic cause. This means Provision of personal protective equipment support & patient safety facility aspect done by management had causal relationship toward basic cause. Other study by Permatasari (2013) showed that there was a significant relationship between Provision of personal protective equipment and knowledge level of nurse p=0.003. The facilities and equipment in organisition is used to easier and to have more provit and also creating work efficiency[8]. The facilities and equipment had important impact of incident in work while using under standart equipment [9].

Safety training

Patient safety training factor had positive contribution and significant in path analysis p-0,000 which means there was a significant relationship between patient safety training and basic cause. This means patient safety training aspect done by management had causal relationship toward basic cause. Other study by Alayyanur (2016) showed that there was significant relationship between patient safety training and knowledge knowledge nurse p=0,042. One of the reason why safety training did not work properly because there was no equivalence between the conditional of success and training, between patient safety training program and the requirement of training needs [1].

CONCLUSION

Lack of control indicator variable of patient safety programs had significant relationship with the basic cause of falling risk on hospitalized patients.

Lack of control indicator variable of supervision had significant relationship with the basic cause of falling risk on hospitalized patients.

Lack of control indicator variable of standard operating procedures had no significant relationship with the basic cause of falling risk on hospitalized patients.

Lack of control indicator variable of Provision of personal protective equipment support & patient safety facility had significant relationship with the basic cause of falling risk on hospitalized patients.

Lack of control indicator variable of patient safety training had significant relationship with the basic cause of falls risk on hospitalized patients.

Conflict of Interest: None

Source of Funding : Department of Occupational Health and Safety, Airlangga University, Surabaya, Indonesia

Ethical Clearance: The study was approved by the institutional Ethical Board of the Public Health, Airlangga University.

All subjects were fully informed about the procedures and objectives of this study and each subject prior to the study signed an informed consent form.

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An Epidemiological Study on the Cause of Intellectual Disability in Ujjain and Shajapur Districts of Central India

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ABSTRACT

Background & objectives: Intellectual disability which is significant limitation in adaptive behavior has highly variable etiology. **Method:** The study investigated the cause of intellectual disability in 204 individuals receiving rehabilitation services in a special school and its outreach settings i.e. integrated training centers (ITC) under a NGO serving Ujjain and Shajapur districts of Central India. **Results:** Among prenatal causes genetic or chromosomal anomalies were the most frequent cause found in 21 individuals. Down syndrome stands out with 16 cases out of 21 individuals with all cases with either severe or moderate mental retardation. Perinatal cause's disability includes 16 individuals with 13 of them with Asphyxia neonatorum as the cause for ID. Among the postnatal causes encephalitis in 14 individuals and head trauma and meningitis in 8 individuals each were most commonly reported. **Conclusions:** Our study demonstrated that individuals with severe mental retardation with a known cause were mainly affected by genetic or chromosomal anomalies. The cause of mental retardation was harder to determine in individuals with mild and moderate mental retardation, and many of those with mild MR with an uncertain cause had a positive family history. The above findings point out the need for prenatal diagnosis and genetic counseling in certain cases, requiring careful attention to ethical issues.

Keywords: *Intellectual disability, Mental retardation, Epidemiology causes*

INTRODUCTION

Intellectual disability (ID) also called intellectual development disorder (IDD)[1] or mental retardation (MR)[2] is defined as- Significant limitation in adaptive behavior were operationally defined as performance that is at least two standard deviations below the mean of either one of the following three types of adaptive behavior: Conceptual, social, or practical, or an overall score on a standardized measure of conceptual, social, or practical skills (2002 AAIDD).[2] IDD has prevalence of 1-3% in India[3] as well as globally[4-5]. Kaplan and sadock[6] (2011) estimated prevalence of mild intellectual disability (IQ 55 to 70) as 85 percent of all persons with Intellectual disability (PwID). Moderate intellectual disability (IQ 40 to 55) is seen in approximately 10 percent while severe intellectual disability (IQ 25 to 40) occurs in about 3 or 4 percent of population of PwID. Causes of intellectual disability are numerous and include genetic and environmental factors. In at least 30 to 50 percent of cases, physicians are unable to determine etiology despite thorough evaluation[7]. Diagnosis is highly dependent on a comprehensive personal and family medical history, a complete physical examination and a careful developmental assessment of the child. Appropriate diagnosis will guide in appropriate evaluations and referrals to provide genetic counseling, resources for the family and early intervention programs for the child[8]. ID has highly variable etiology and several studies are investigating the causes for these disorders. However, most are based on in-patient populations and

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very few study causes in a school settings serving specific zone. Therefore this study was planned to investigate the cause of intellectual disability (ID) in 204 individuals receiving rehabilitation services in a special school and its outreach settings i.e. integrated training centres (ITC) under a NGO serving two districts of Central India.

MATERIAL AND METHOD

Methodology: The present study was designed as a cross-sectional study over one academic year (July 2011-April 2012). The study was conducted among all children with intellectual disability receiving rehabilitation services in a special school and its outreach settings i.e. integrated training centers (ITC) under a NGO serving Ujjain and Shajapur districts of Central India. Students with profound mental retardation and care group attending these settings for physiotherapy, students whose parents didn't give consent for interview and who couldn't complete one academic year after start of study were excluded from the study. A total of 204 students fulfilled the above mentioned criteria from all study settings and were investigated to identify the cause of ID using a pretested and predesigned proforma.

DATA COLLECTION

To start with, the list of all the study subjects was prepared. Group meetings of the class teachers were arranged in both types of study setting to apprise them the purpose of the study as well as to ensure their cooperation. Parents or caretaker (in case of students staying with foster parents) were informed telephonically about the nature of the study and were asked to carry their child's medical reports along with all the investigations if done previously during the periodic teacher-parent meetings in the school premises. During meetings the parents of study subjects who consented were interviewed to investigate into the details of cause of mental retardation along with various associated medical problems. Data was verified from the medical records of the student in their respective school. Help of school appointed Psychologist was taken. The protocol of the study was approved by Ethics committee of the institute. The data was tabulated and analyzed using appropriate statistical tests.

RESULTS

The time of cause was categorized into three groups: prenatal, perinatal and postnatal. The cause of severe mental retardation was determined in 38 cases while for moderate it was 89 cases and for mild mental retardation (MR) the cause was determined in 77 cases (Table 1). Among prenatal causes genetic or chromosomal anomalies were the most frequent cause found in 21 individuals. Down syndrome stands out with 16 cases out of 21 individuals with all cases with either severe or moderate mental retardation. Two cases of Williams syndrome, while one case each of Prader wali syndrome, Angelman and Recklinghausen syndrome was found. There was just one case of mild MR with genetic or chromosomal anomalies. Moreover, prenatal causes include congenital infections such as cytomegalovirus, toxoplasmosis, herpes, rubella and prolonged maternal fever in the first trimester in five respective cases. Exposure to anticonvulsants and alcohol was also reported in three cases.

Perinatal causes of intellectual disability (ID) include 16 individuals with 13 of them with Asphyxia neonatorum as the cause for ID. Among the postnatal causes encephalitis in 14 individuals and head trauma and meningitis in 8 individuals each were reported. Severe prolonged malnutrition and extreme low birth weight were among the other causes reported. (Table 2)

Table 1: Distribution of persons with intellectual disability based on Intellectual Quotient

Intellectual disability	Frequency N=204	%
Severe	38	18.63
Moderate	89	43.63
Mild	77	37.74

Table 2: Distribution of study subjects according to intellectual disability based on etiological factors.

Time of onset	Total n=204, (%)	Severe MR n=38, (%)	Mod MR (n=89, %=43.62)	Mild MR n=77(%)
Prenatal	40 (19.60)	16 (7.84)	13 (6.37)	11 (5.39)
Genetic or chromosomal anomalies	21 (10.29)	14 (6.86)	6 (2.94)	1 (0.49)
Congenital infections	5 (2.45)	1 (0.49)	2 (0.98)	2 (0.98)
Exposure to anticonvulsants/alcohol	3 (1.47)	0 (0)	0 (0)	3 (1.47)
Congenital hydrocephalus	1 (0.49)	1 (0.49)	0 (0)	0 (0)
Uncertain Congenital malformations	10 (4.9)	0 (0)	5 (2.45)	5 (2.45)
Perinatal	16 (7.84)	2 (0.98)	12 (5.88)	2 (0.98)
Asphyxia neonatorum	13 (6.37)	2 (0.98)	11 (5.39)	0 (0)
Forceps delivery	1 (0.49)	0 (0)	0 (0)	1 (0.49)
Kernicterus	1 (0.49)	0 (0)	1 (0.49)	0 (0)
Head trauma	1 (0.49)	0 (0)	0 (0)	1 (0.49)
Postnatal	43 (21.07)	7 (3.43)	14 (6.86)	22 (10.78)
Encephalitis	14 (6.86)	1 (0.49)	5 (2.45)	8 (3.92)
Meningitis	8 (3.92)	2 (0.98)	2 (0.98)	4 (1.96)
Head trauma	8 (3.92)	1 (0.49)	2 (0.98)	5 (2.45)
Severe and prolonged malnutrition	4 (1.96)	0 (0)	2 (0.98)	2 (0.98)
Extreme low birth weight	5 (2.45)	0 (0)	2 (0.98)	3 (1.47)
Postvaccinal encephalosis	1 (0.49)	0 (0)	1 (0.49)	0 (0)
Chronic lead exposure	1 (0.49)	1 (0.49)	0 (0)	0 (0)
West's syndrome	1 (0.49)	1 (0.49)	0 (0)	0 (0)
brain tumors	1 (0.49)	1 (0.49)	0 (0)	0 (0)
Uncertain etiology	105 (51.47)	13 (6.37)	50 (24.50)	42 (20.58)

DISCUSSION

Total of 204 (92.3%) students were studied out of 221 enrolled with a mean age 13.02 (range 4 to 34 years). Our study determined prenatal causes in 19.60 % of cases while the study by Yoshida[9] determined them in 23.14% of cases. The differing results may very well be due to the difference in age groups. In our study the average age was 13.02, while in the Yoshida[9] study it was 22. This age difference is because our study was carried out in school children with ID (range 4 to 34) unlike Yoshida study which was conducted in PwID seeking healthcare services. The majority of genetic and chromosomal causes in our study include Down's syndrome which is reported as the most common and most familiar genetic cause of mental retardation in many studies[10]. Also parents don't tend to send children with syndromes of more severity to schools for rehabilitation (as told by school authorities). So our study had no case of Smith-Lemli-Opitz syndrome, and others at high risk for young death such as ceroid lipofuscinosis.

To discuss the issues of the perinatal period criteria for cause classification, asphyxia neonatorum is the most common condition reported and most cases have moderate mental retardation. Our study determined postnatal causes in 21.07% of cases while the study by Yoshida[9] determined them in 8.9% of cases. This wide differing result may again be explained by difference in mean age in the two studies as mentioned earlier. Our study showed that the proportion of cases with an uncertain cause was higher for moderate and mild cases than for severe mental retardation group. A few uncertain cases in the mild and moderate mental retardation group

have strong hereditary factors as a possible cause and many other causes remains undiagnosed. A study of an affected family by Farag [11] showed that Mendelian inheritance was involved in 34% of cases.

To conclude individuals with severe mental retardation with a known cause were mainly affected by genetic or chromosomal anomalies. Individuals with moderate and mild mental retardation with an unclear cause showed a little of more familial trend. The above findings point out the need for prenatal diagnosis and genetic counseling in certain cases, requiring careful attention to ethical issues. Regarding mental retardation cause studies, an international classification system is lacking, and efforts should be made to create a detailed classification system.

CONCLUSION

Intellectual disability is among the most difficult categories of childhood disability to document epidemiologically as it is multifactorial. In developing countries the difficulties of documenting the cause of MR are compounding by lack of diagnostic services and routinely collected health data. Our finding suggested that primary prevention of serious cognitive disabilities will require prevention of antenatal, natal and post-natal factors.

Source of Funding: Self

Conflict of Interest: Nil

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Development and Testing of High Order Thinking Skills (HOTS) Training Module for Sciences Subjects among Secondary School Students in Malaysia

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ABSTRACT

The study aims to develop, test the value of the content validity and the reliability of the High Order Thinking Skills (HOTS) Training Module for Science Subject among Secondary School Students in Malaysia. This module is developed based on six (6) HOTS main strategies by Bloom's[1] Taxonomy (1956) and was updated with Anderson's[2] Taxonomy (2001) which is to remember, understand, apply, analyze, evaluate and create. The HOTS module has eight sessions: Session 1: Introduction: Understanding HOTS in Science subjects, Session 2: HOTS Strategy 1: Remembering Skills, Session 3: HOTS Strategy 2: Understanding Skills, Session 4: HOTS Strategy 4: Analytical Skills, Session 6: HOTS Strategy 5: Evaluation Skills, Session 7: HOTS Strategy 8: Creating Skills and Sessions 8: Integrating 6 HOTS strategies in Science subjects. To test the content validity, a panel of 14 experts in HOTS, science, mathematics, psychology, counseling and education were selected to answer the content validity questionnaires of the module based on Russell[3] (1974) and the validity questionnaire of session and activity suitability based on Mohammad Aziz Shah[4] (2010). Subsequently, 34 respondents of secondary school students in Selangor undertook a pilot test to obtain the reliability value. The findings of the content validity of the module based on Russell[3] (1974) were 0.844 (84.40%) and the validity value on suitability of the sessions and activities based on Mohammad Aziz Shah[4] (2010) was 0.863 (86.30%). The value of reliability of the entire module is high at .987. The results of the study show that HOTS Training Module for Science Subjects in Secondary School Students in Malaysia have high content and reliability values and prove that HOTS Training Modules are suitable for use in school environments in Malaysia to enhance students' high-level thinking skills in science subjects.

Keywords: *Content Validity, Reliability, High Order Thinking Skills (HOTS), Science subject*

BACKGROUND OF THE STUDY

The thriving globalization era has had a direct impact on the global education world. The present generation who will become future leaders are required to move in tandem with the progress of this global education. The present generations are also advised to learn the essential skills that individuals need to be excellent and able to move in tandem with current changes. Rajendran[5] (2001) states that the strength of a nation lies in the people who have a high level of knowledge and the various mastered skills. Therefore, thinking skills are among the key skills that the current generation needs to master.

Thinking skills are among the key fundamentals to chart creative educational development among students. The emphasis on thinking skills in all subjects at school allows the development of the students' thoughts and the students can think and make rational, considerate and objective decisions (Rohaida & Zamri[6], 2015). This thinking skill has long been introduced in teaching and learning and is known as critical and creative thinking

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skills (Arni Yuzie & Ruhizan[7], 2015).

As such, the education system in Malaysia through Malaysia Education Blueprint (PPPM) 2013-2025 has undertaken several transformation that emphasize on thinking skills and the aspects of problem solving to address this aspiration. It has been noted in the Smart School Curriculum implemented with the attention to the development of cognitive capabilities. This change is carried out comprehensively involving pre-school education all the way through higher education institutions by placing HOTS as one of the main aspects which emphasized on teaching.

RESEARCH METHODOLOGY

The design of this study is a descriptive study which involves development analysis, content validity analysis and reliability analysis. Mohd Majid[8] (2005) states that a descriptive study describes a situation or phenomenon being studied. Furthermore, Sidek[9] (2002) notes that descriptive design aims to provide systematic information about the facts and characteristics of a population or field of interest factually and accurately. This study is divided into two forms of descriptive study: preliminary study and survey-based studies by testing the validity and reliability of the module. This section describes the process of study which has three main phases i.e., phase I: Development of modules, sub modules and activities based on library research, phase II: Testing the value of the content validity by the experts and phase III: Testing the reliability value of the module.

Phase 1: Development of modules, sub modules and activities

Phase I of the study is the development of the modules and sub-modules based on Anderson's[2] Taxonomy through library research. The selection of the Anderson Taxonomy approach was made after a detailed literature study was conducted based on the writing of books, journals and articles.

Phase 2: Obtaining Content Validity

Content validity is a measuring tool that examines how far a module can be used. Fauzi, Jamal and Mohd Saifoul[10] (2014) stated that validity is the ability of the measuring tool to measure what should be measured. According to Majid[8] (2005), and Wiersma and Jurs[11] (1990), the validity of a measuring tool is said to be high if it can measure what to be measured. This validity is very important as a valid statement or explanation if it represents exactly the characteristics of the phenomenon being theorized, explained or described (Hammersley and Atkinson[12], 1995).

Module evaluation experts panel are selected among individuals who are experts in the field related to the research conducted by researchers. This assessment aims to assess the suitability of the items used to measure the chosen domain. Othman[13] (2001) stated that six to nine expert panel members are sufficient in evaluating the validity of sub module content and research items.

The expert validation method is divided into two parts: a) expert assessment based on Russell[3] (1974) which consists of five statements regarding the validity of the module content, and b) the validity of the session and activities suitability according to Mohammad Aziz Shah[4] (2010). The validity of the activities and sessions suitability in the module is assessed using the items representing the sub modules in which an appraisal expert panel approves on those items by selecting the scale of agreement from 0 to 10.

Phase 3: Analysis of Reliability

Furthermore, the researcher carried out the process to obtain the module reliability value by distributing the reliability questionnaire to the respondents. The questionnaire developed by the researcher consists of items based on session and activities in the HOTS Training Module for Science Subjects among Secondary School Students in Malaysia. Reliability is often referred to as a reflection of internal stability and consistency (Creswell[14], 2005). The basis for good reliability value is taken from Kerlinger[15] (1979) that a questionnaire with a value of α (alpha) exceeding 0.6 at a significant level of 0.05 is a good assessment. Once this module receives the appropriate validity value, then it can be administered among students, teachers and civil servants. To obtain statistical data, the researcher uses Statistical Package for the Social Science (SPSS) to get the Cronbach Alpha value to evaluate the module questionnaire reliability.

After going through the first phase, the second phase and the third phase, the module is ready for use by researchers on study group. The modules are said to be in compliance with the module development rules and can be used if the module meet the objectives of the module development and provide a good impact (Sidek[9],

2005).

The study subjects and study location

The study subjects were only involved in the second phase and the third phase of the study. For the second phase, the study subjects were divided into two groups: three language experts in the UPSI Language Department to review on the language accuracy and the module terms and the eleven panel of experts to evaluate the content validity of the HOTS Training Module. The third phase of the study is to obtain the reliability value of the module which involve secondary school students in Selangor as the study subjects.

The study location for Phase 1 is at the library of Sultan Idris Education University (UPSI). The location for Phase 2 is at the UPSI and various secondary schools where the validity questionnaire of this module is distributed. The study location for Phase 3 is in secondary schools in Selangor. The selection of study location was based on the suitability of the respondents at the location to meet the needs of the study.

RESEARCH FINDINGS

Phase 1 Study Findings

In the first phase of the study, researchers were able to develop the modules, sub modules and activities for HOTS Training Module for Science Subjects among Secondary School Students in Malaysia. This module involves the development of modules, sub modules and self-directed activities containing eight sub modules and eight self-directed activities.

Phase 2 Study Findings

To obtain its content validity, a specific formula is used, where the total number of scores filled by the expert (x) will be divided by the overall total score (y) and multiplied by one hundred. A module is confirmed to have a high validity when it scores above 70% (Tuckman[16], 1978; Jamaludin[17], 2002; Sidek and Jamaludin[18], 2005). The summary of the formula is;

Expert Score Total (x)

X 100% = Module Content Overall Score Total (y)
Validity Level

For this study, two expert validation methods were conducted, namely; A) the overall content validity based on Russell's[3] (1974) method which has five statements about the validity of the module and b) the validity of session and activity suitability of sub module based on Mohammad Aziz Shah[4] (2010). According to Mohd Majid[8] (1998), a panel of three experts is sufficient to evaluate the expert's validity of a questionnaire. While Based on external critic's method, the researcher selected ten criticism from panel of experts to evaluate the HOTS Training Module for Science Subjects among Secondary School Students in Malaysia. The selection of this expert panel was done based on their expertise in the field of guidance and counseling, the development of modules and their in-depth experiences as academics of psychology and counseling. For this process, the researcher provided a complete copy of the HOTS Training Module for Science Subjects among Secondary School Students in Malaysia which contains the research introduction and training module manual which includes introduction, objective, activity instruction, formulation and related appendices to obtain the expert's critics and recommendations for each module and activity developed. The scales for this evaluation are ten points of choice i.e.; 1 (strongly disagree) to 10 (strongly agree).

Therefore, the expert panel evaluation based on the validity of the module by Russell[3] (1974) are as shown in Table 1.

Table 1: Percentage Value of Validity and Experts Views on the Content Validity of HOTS Training Module for Science Subjects among Secondary School Students in Malaysia Based on Russell[3] (1974) (n=14)

Statement	Validity Percentage (%)	Expert's views
The content of this module meets its target population	90.2%	Accepted
The content of this module can be implemented perfectly	85.7%	Accepted
The content of this module correspond to the time allocated	83.6%	Accepted
The content of this module can change the mindset of the individual more effectively	80.6%	Accepted
The content of this module which can alter individual's perception of their character is brilliant	81.9%	Accepted
Overall Module	84.4%	Accepted

The evaluation panel has obtained the validity value for the sessions and activities of the HOTS Training Module for Science Subjects among Secondary School Students in Malaysia based on Mohammad Aziz Shah[4] (2010). The findings are as shown in Table 2.

Table 2: The content validity value for the sessions and activities of the HOTS Training Module for Science Subjects among Secondary School Students in Malaysia based on expert panel's evaluation according to Mohammad Aziz Shah[4] (2010) (n = 14)

Session	Activity	Total Score	Validity Percentage (%)	Expert View
Session 1:	Activity 1: Introduction: Understanding HOTS in Science Subject	924	92.4	Accepted
Session 2**:**	Activity 1: HOTS 1 Strategy: Memorizing in Science Topic: Light and Optics	872	87.2	Accepted
Session 3:	Activity 1: HOTS 2 Strategy: Understanding in Science Topic: Light and Optics	886	88.6	Accepted
Session 4:	Activity 1: HOTS 3 Strategy: Application in Science Topic: Light and Optics	833	83.3	Accepted
Session 5:	Activity 1: HOTS 4 Strategy: Analyzing in Science Topic: Light and Optics	835	83.5	Accepted
Session 6:	Activity 1: HOTS 5 Strategy: Evaluating in Science Topic: Light and Optics	875	87.5	Accepted
Session 7:	Activity 1: HOTS 6 Strategy: Innovation in Science topic: Light and Optics	826	82.6	Accepted
Session 8:	Activity 1: Integration of 6 HOTS content in Science Subject	852	85.2	Accepted
	Overall Module	6903	86.3	Accepted

Phase 3 Study Findings

Russell[3] (1974) stated that to test the reliability of a module is to see how far a student can follow the module content. While Sidek[9] (2005) explained that there are two methods to test the reliability of a module i.e. through the steps in each activity or through the objective in a module. In this study, the researcher has developed a questionnaire which can test the reliability of the module and it is implemented on the form one secondary school students in Selangor.

The basis for the reliability value of a good questionnaire was taken from Kerlinger[15] (1979) that a questionnaire with a α (alpha) value exceeding 0.6 at a significant level of 0.05 is a good assessment. This is because each step in this module activity will determine whether the participant has mastered the objective of the module. According to Majid[8] (2005), a measuring instrument is said to be high if the measuring instrument can measure what to be measured. The findings of reliability study are as shown in Table 3.

Table 3: Reliability Coefficients value of the HOTS Training Module for Science Subjects among Secondary School Students in Malaysia (n = 34)

Session	Activity	Reliability Coefficients Value	Result
Session 1:	Activity 1: Introduction: Understanding HOTS in Science Subject	.897	High
Session 2**:**	Activity 1: HOTS 1 Strategy: Memorizing in Science topic: Light and Optics	.896	High
Session 3:	Activity 1: HOTS 2 Strategy: Understanding in Science topic: Light and Optics	.928	Very High
Session 4:	Activity 1: HOTS 3 Strategy: Application in Science topic: Light and Optics	.948	Very High
Session 5:	Activity 1: HOTS 4 Strategy: Analyzing in Science topic: Light and Optics	.919	Very High
Session 6:	Activity 1: HOTS 5 Strategy: Evaluating in Science topic: Light and Optics	.944	Very High
Session 7:	Activity 1: HOTS 6 Strategy: Innovation in Science topic: Light and Optics	.957	Very High
Session 8:	Activity 1: Integration of 6 HOTS content in Science Subject	.916	Very High
	Overall Module	**.987**	**Very High**

Significance value at >0.05

CONCLUSION

Overall, this study is successful in developing High Order Thinking Skills (HOTS) Training Module for Science Subject among Secondary School Students in Malaysia based on theory and past studies. Furthermore, HOTS Training Module for Science Subjects among Secondary School Students in Malaysia have also been shown to have high content validity and reliability. This module is proven to be suitable to be used in the field of education especially in schools in enhancing student's learning potential.

Conflict of Interest: None

Source of Funding: Special Education Research, Sultan Idris Education University

Ethical Clearance: Not required

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The Analysis of Factors which are Related to the Compliance of Welder Workers in using Workplace Personal Protective Equipment in Pt. Pal Indonesia

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ABSTRACT

The compliance of weld workers in the use of personal protective equipment is one of the major factors in the workplace health and safety. It is because the welder workers have a very high risk of accidents and disease. This research was aimed to find out the factors that related to the compliance of weld workers in the use of the personal protective equipment based on the valid Standard Operating System in PT. PAL Indonesia.

The research was a quantitative research with cross sectional approach. This research used observation method by observing the use of personal protective equipment during the welding process. The variables used in this research were the characteristics of the workers (age, working period, working status, education, and knowledge), responsibility, legitimacy of authority figure, Status of authority figure, supervision, support of co-workers, location status, facilities of personal protective equipment, and standard operating system. The subjects of the research were 72 weld workers. Data were collected by observing directly using check list table cased on the standard operating system that used in PT. PAL Indonesia.

The results showed that knowledge and supervision were the determining factors with p-value 0,003 and 0,014, it means that workers with little knowledge and without supervision tend to violate the rule to use the personal protective equipment than the ones with knowledge and supervision.

Keywords: *personal protective equipment, compliance, welder workers*

INTRODUCTON

Ship manufacturing is one of industries which use advanced technology and have high potential of accident. The potential accidents that might happen at ship manufacturing are varied and can be classified as biological, physical, chemical, ergonomic, psychosocial, mechanical, electrical, and B3[1] hazards. It is right to say that the work of ship manufacturing has a very high risk of accident. In the period of January 2000 – January 2011, 117 workers died at shipyard in Turkey because of accident at work[1]. The accident in Turkey is caused by five reasons, which are falling from high place, contact with electric or fire, downtrodden and wedged[1]. The result analysis of the cause of accident in Shipyard in Turkey is 80% caused by unsafe action[2]. One of the works that have high risk of accident and disease is welding process. Welding is an activity done by welder to combine or connect metal. Welding is a work that uses heat. Potential hazards at welding process are; 1). Physical hazards: electric, radiation, heat, fire, wildfire, explosion, noise and magnetic field.; 2) Chemical: welding smoke, fuel gas, inert gas, gas mix and solvent.; 3) General hazard: The hazard do not directly related with welding or metal cutting[3].

Trauma cases caused by works were 2175, male workers were placed first with 2112 workers (97.1%), and therefore work with the most cases of accidents was welding with 838 cases[4]. Occupational Safety and Health Administration (OSHA) has researched and stated that there are 200 cases of death which are related to welding process generally caused by clumsiness, mistakes in the use of personal protective equipment (PPE), the use of bad personal protective equipment (PPE) and other mistakes[5].

Protective equipment is a control which is obligatory for workers and provided by company. The obligation in using the protective equipment is ruled in the constitution law No.1 year 1970 about work safety[6]. Even though personal protective equipment is the most simple safety kit, there are still many failure factors in the use of it. The use of protective equipment will be effective if it is used according to the Standard Operating System (SOP). Therefore standard procedure of protective equipments for welder at PT PAL are safety helmet, safety shoes, wear pack, leather apron, stiwel, Welding Helmet, welding respirator, hand shields, long leather gloves[7].

The purpose of this research is to know the compliance in using personal protective equipment according to the Standard Operating System (SOP)

MATERIAL AND METHOD

The type of this research was observational with cross sectional approach. The research location was in PT. PAL Indonesia in trade ship division. The early data was taken in 30 November 2016 and research was done in March 2017. The population was 87 workers which are permanent workers and contemporary workers in the trade ship division of PT. PAL Indonesia. The sample of the research was 72 workers. The data was taken by giving questioner about internal factors (age, working period, employment status, education, knowledge and responsibility) then organization factors (Legitimacy of authority figure, status of authority figure, co-workers support, location status, supervision, facility of personal protective equipment and SOP) and observing the use of personal protective equipment based on the Standard Operating System in PT. PAL Indonesia. The researcher then analyzed the result of the questioner and observation with ABC theory

FINDING

Research internal factors in this research can be described in the table 1 below:

Table 1. Internal Factor

Variable	Category	Amount	(%)
Age	20-30years old	21	29.2
	31-40years old	17	23.6
	> 40 years old	34	47.2
Working period	< 5 years	26	36.1
	5-10 years	8	11.1
	> 10 years	38	52.8
Employment status	Organic	39	54.2
	PKWT	33	48.8
Education	Middle School	3	4.2
	High School	66	91.7
	Undergraduate	3	4.2
Knowledge	Low	9	12.5
	Enough	33	45.8
	Good	30	41.7

Characteristic data collection was done by questioner covered age, working period, employment status, education and knowledge.

The result of external factors questioner which covered responsibility, Legitimacy of authority figure, status of authority figure, co-workers support, location status, supervision, facility of personal protective equipment, standard operating system

Table 2: External Factors

Variable	Category	Amount	Percentage (%)
Responsibility	Enough	6	8.3
	Good	66	91.7
Legitimacy of authority figure	Low	2	2.8
	Enough	23	31.9
	Good	47	65.3
Status of authority figure	Low	0	0
	Enough	34	47.2
	Good	38	52.8
Co-workers support	Low	5	6.9
	Enough	38	52.8
	Good	29	40.3
Location Status	Low	2	2.8
	Enough	11	15.3
	Good	59	81.9
Supervision	Low	12	16.7
	Enough	35	48.6
	Good	25	34.7

Cont... **Table 2: External Factors**

Facility of protective equipment	Low	3	4.2
	Enough	19	26.4
	Good	50	69.4
Standard Operating System	Low	3	4.2
	Enough	10	13.9
	Good	59	81.9

Observation result on the compliance in using protective equipment according to SOP

Table 3: The compliance in using personal protective equipment according to SOP

Variable	Category	Amount	Percentage (%)
The compliance in using protective equipment according to SOP	Low	6	8.3
	Enough	50	69.4
	Good	16	22.2

Spearman Rank correlation test was used to find how far the correlation of internal and external factor to the compliance in the using of personal protective equipment according to the SOP.

Table 4: Results on the correlation of internal and external factor to the compliance in the using of personal protective equipment according to the SOP.

Variables	p- value	Result
Age	0,196	Insignificant
Working Period	0,496	Insignificant
Employment Status	0,324	Insignificant
Education	0,112	Insignificant
Knowledge	0,022	Significant
Responsibility	0,082	Insignificant
Legitimacy of authority figure	0,296	Insignificant
Status of authority Figure	0,361	Insignificant
Co-workers support	0,256	Insignificant
Location Status	0,505	Insignificant
Supervision	0,039	Significant
Facility of protective Equipment	0,538	Insignificant
SOP	0,525	Insignificant
(α = 0,05)		

Table 4 showed the significant correlation between knowledge and supervision of the compliance in the using of personal protective equipment according to SOP.

Tabel 5: Results on regresi ordinal of Knowledge factor and Supervision to the compliance in the using of personal protective equipment according to the SOP.

Variable	Parameter Value (B)	P Value	Exp (B)
Knowledge	-2,105	0,003	0,12
Supervision	-1,600	0,014	0,2

Table 5 showed the influence correlation between knowledge and supervision of the compliance in the using of personal protective equipment according to SOP.

Age

There was no correlation between age with compliance in using the personal protective equipment according to SOP The result of the researcher showed that workers in the range of age 31-40 have good compliance in the using of personal protective equipment according to the SOP. This statement supported by the result of research done by Diah (2014)[8] which stated that there is no significant correlation between age and compliance in using the personal protective equipment.

Working Period

There was no correlation Working Period with compliance in using the personal protective equipment according to SOP. This statement was supported by research by Yuliana (2016)[9] in which nurses with working period more than 10 years are nurses who have enough compliance in using personal protective equipment. According to (Robbins, 2008)[10] working period that is too long without variation will decrease someone's working spirit to be complied during work.

Employment Status

There was no correlation Employment Status with compliance in using the personal protective equipment according to SOP. It is supported by a research by Nugroho (2004)[11] which stated that there is no correlation between Civil Servants with contract employee in the

use of personal protective equipment.

Education

There was no correlation Education with compliance in using the personal protective equipment according to SOP. The results of this study is supported by Anjari (2014)[12] which says there is no relationship between the level of education of workers with compliance with the use of PPE

Knowledge

The results of this research showed that there is significant correlation between knowledge with compliance in using the personal protective equipment according to SOP and it matched with the research that was done by Anjari (2014)[12] that there are correlation between knowledge with in using the personal protective equipment in construction workers. The other suitable theory is safety triad by Geller (2001)[14] it is explained that knowledge has significant correlation with compliance in using the personal protective equipment.

Responsibility

From the correlation test, it was found that there was no significant correlation between responsibility with compliance in using the personal personal protective equipment according to SOP. The result of this research is supported by the result of another research conducted by Dewi (2016)[14] which showed that there was no correlation between responsibility with compliance of nurse to wash their hands with handrub.

Legitimacy of authority figure

There was no correlation between legitimacy of authority figure with compliance in using the personal protective equipment according to SOP. It is supported by the research that was done by (Mahfudhoh, 2015)[15] which stated that the authority level of the management of Jemursari Hospital in Surabaya which based on main task and function, did not influence the compliance in writing formularium prescription.

Status of authority figure

There was no significant correlation between status of authority figure with the compliance in using the protective equipment according to SOP. It fit the result of a research by Madfudhoh (2015)[15] which stated that doctor's perception to the status of authority figure did not influence significantly to the compliance in writing prescription based on formularium.

Co-Workers support

From the result of the research it was found that there is no correlation between co-workers with the compliance in using the protective equipment according to SOP. It was supported by the research by Miftahul (2013)[16] which stated that good co-workers support has decreased compliance in nursery documentation. Social validation by Tyler(2009)[17] stated that someone take action which recommended by other people or organization only if there is proof that other people have done it before.

Location status

It was found that there was no correlation between location status with compliance in using the personal protective equipment according to SOP. Meanwhile the result of this research is supported Madfudhoh (2015)[15] that there was no significant correlation between location status with compliance in writing prescription according to formulary.

Supervision

In this research there was correlation between supervision with compliance in using the personal protective equipment according to SOP. It is compatible with the Milgram theory. One of the certain factors in the research theory of Milgram (1974)[19] is about compliance is supervision or direct presence. The presence of leader can control and give direct guidance about what should be done. The result of this research was also supported by the result of research by Chandra (2015)[20] that there was correlation between supervision with compliance in using the personal protective equipment for ear in PLTD Ampenan.

Facility

The results found that there was no correlation between the facility of protective equipment with the compliance in using the protective equipment according to SOP. It was supported by the research by Renganis (2012)[21] that even a company has provided free protective equipment, it did not necessarily make the workers realize the importance of personal protective equipment during work.

SOP

The result showed that there was no correlation between SOP with the compliance in using the personal protective equipment according the SOP. The result of this research was supported by the research by Anam (2016)[22] which stated that there is no significant correlation between SOP with compliance to obey SOP.

Regresi Ordinal

Based on ordinal regression test results obtained a significant influence between supervision and knowledge in the use of personal protective equipment in accordance with SOP

CONCLUSION

The behavior of using protective equipment in PT.PAL Indonesia has enough compliance, there are still many workers did not use complete protective equipment.

There is correlation and influence between knowledge and supervision to the compliance in using protective equipment in PT.PAL Indonesia.

Conflict of Interest: None

Source of Funding: Departement of Occupational Health and Safety, Airlangga University, Surabaya Indonesia

Ethical Clearance: The study was approved by the institutional Ethical Board of the Public Health, Airlangga University.

All subjects were fully informed about the procedures and objectives of this study and each subject prior to the study signed an informed consent form.

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Analysis of Relation between Life Style, Workload, and Work Stress with Metabolic Syndrome

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ABSTRACT

Metabolic syndrome is a set of risk factor symptoms of cardiovascular disease and diabetes mellitus. Risk factor symptoms are found on Officers of Tanjung Perak Port Class I Health Office, some of them are urban society lifestyle, heterogenous workload and stress based on the working scope, administrative and field work. This research is aimed to analyze the relation between lifestyle, workload, and work stress with metabolic syndrome and its five indicators (blood pressure levels, pre-prandial blood glucose levels, HDL cholesterol levels, abdominal circumference, and triglycerides levels)

This research is an observational research with cross sectional research design. The number of research respondents is 39 Government Employees. Lifestyle, workload, and work stress are independent variables. The dependent variables are metabolic syndrome and its five indicators.

13.4% of respondents have metabolic syndrome. Analysis of fisher test found there is a significant relation between frequency of fruit consumption and metabolic syndrome (p=0,047).

It is suggested to do a regular medical examination program and provide some variation of fruits menu to be served in meetings or office agendas in order to increase the frequency of fruits consumption.

Keywords*: Metabolic Syndrome, Employees, Lifestyle, Workload, Work stress.*

INTRODUCTION

Precusors of non-communicable diseases such as diabetes mellitus and cardiovascular diseases are known as metabolic syndrome[1]. Metabolic syndrome is a set of risk factor symptoms of cardiovascular diseases and diabetes mellitus[2]. The symptoms are abdominal circumference or abdominal obesity, increased blood pressure, increased pre-prandial blood glucose levels, triglycerides levels, decreased HDL cholesterol levels, if three of the five symptoms are met, the employee can be categorized in metabolic syndrome[3].

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Metabolic syndrome prevalence in developing countries, Iran (30%), South Korea (28%), India (25%), Hongkong and Mexico (22%), Vietnam (18.5%), Oman and Palestine (17%), Taiwan (15.1%), and China (13.3%)[4]. Metabolic Syndrome Prevalence based on work types on 120,000 workers in Japan was found that construction workers, and health officers have the highest prevalence[5].

Specifically, there is no information found about metabolic syndrome prevalence in Indonesia as developing country, on the workers or based on the work statuses. But, based on *Riset Kesehatan Dasar* (Basic Health Research) on 2013, the number of coronary artery disease prevalence as one of the outcomes of metabolic syndrome in Indonesia (2013) found in the working age group 15-55 years old, diagnosed by doctors is 1.3% and symptoms is 5%[6]. Furthermore, according to Basic

Health Research Data in 2007, obesity prevalence on people aged <15 years old is 13,9% on male, and 23,8% on female[7]. Prevalence levels based on work types is higher on employees and entrepreneurs compared to works such as farmers, fishers or labors. Meanwhile, hypertension prevalence on people aged >18 in Indonesia is 31,7%[7]. Obesity prevalence is found increased (19,7) on Basic Health Research in 2013, with prevalence based on work types is still higher on employees and entrepreneurs compared to farmers, fishers or labors[6].

The high number of metabolic syndrome prevalence in some developing countries, including Indonesia, is caused by the changes in the era of industrialization and urbanization so it causes changes in lifestyle on industrial society. Industrial people lifestyle tends to be recognized by the decrease of physical activity, and the increase of energy consumption. The decreased of physical activity, exercise habits, and the increase of energy consumption cause the obesity increase in industrial society, which obesity is one of risk factors of metabolic syndrome[4]. Dominant factor of the obesity other than the lack of physical activities is also the high number of fatty foods consumption[8].

Based on meta analysis from 13 studies about smoking habits mentioning that active smoking is related with increased risks of metabolic syndrome[9]. Nutrition intake, physical activity, and exercise habits are risk factors that can be modified, so it can be a preventive way or countermeasures of metabolic syndrome risks. Physical activity according to Tarwaka (2005) in working place can be reviewed from working activity through physical work load is also a risk factor that can be modified. Considering that human activity is not only loaded physically, but also mentally, so each of them has different level of loads and effects[10]. Both demands of physical and mental load with their interaction is proven increasing biomechanical load, physiological reactivity, and performance disruption[11]. A strong relation between overall workload, physic and mental, and health problems is rarely studied, so the related studies should be known.

The research is aimed to analyze the relation between risk factors of metabolic syndrome such as life style, workload and work stress with metabolic syndrome on government employees in health office of Tanjung Perak port Surabaya.

It is interesting because metabolic syndrome case is believed that has cause more health care cost from the company, and also decrease the workers life quality during the working period or after the working period ends (retired or stop working)[12].

MATERIAL AND METHOD

The research design used is cross sectional with observational research as the type of the research. The number of respondents are 39 people with criteria inclusion, healthy, and voluntarily agree to be the respondents of the research. The research located in the Port Health Office Class I Surabaya conducted in January-June 2017.

The research independent variables are life style (diet (calories intake, types (staple, side dish, vegetables, fruits, and snacks), and frequency), consumption levels (carbohydrates, proteins, and fats), smoking habits (smoking status, number of cigarate consumption, duration of smoking), drinking habits, and exercise habits, workload (physical and mental workload), and work stress. The dependent variables are metabolic syndrome, and its five indicators (blood pressure, pre-prandial blood glucose levels, HDL cholesterol levels, abdominal circumference, and triglycerides levels).

The data collection technique was valid questionnaires about smoking habits, drinking habits, exercise habits, mental workload, and work stress. Questionnaire about mental workload used NASA TLX questionnaire, and working stress questionnaire used questionnaire from HSE. Respondents' diet was measured using food frequency and food record for 3 days. The measurement of abdominal circumference (abdominal obesity) used measuring tape, physical workload is measured by Calorimeter Heart Rate Watch, Brand: Ultimate Gear. The examination of pre-prandial blood glucose levels, triglycerides, and HDL cholesterol is done by blood laboratory examination. Blood pressure measurement used tensimeter Hg, Brand: OneMed. Methods of analysis used are descriptive analysis and bivariate analysis.

FINDING

Individual Characteristics

The youngest respondent of the research is 27 years old, and the oldest respondent is 57 years old.

The number of female respondents (51.3%) is slightly bigger than the male respondents (48.7%). There is less research respondents who have hereditary diabetes mellitus (48.7%) than who have hereditary hypertension (59%) in their family.

Life Style

In a day, the average number of energy of the research respondents is 1563,21 KiloCalories, and could be categorized as a lack of calorie consumption. Most of the respondents consume complete types of food (staple, side dish, vegetables, fruits, and snacks). The highest frequency of eating for staple (94.9%), side dish (69.2%), vegetables (56.4%) and fruits (51.3%) is/ more than 3 times a day, and for the snacks, the highest frequency is 1-3 times a week.

Level of consumption of Carbohydrates (94.9%), Protein (59%), and Fats (82.1%) of research respondents is mostly on very low level of consumption. 20.5% of respondents is active smokers, 84.6% of respondents are light smoker, 12.8% are moderate smokers, and 2.6% of the them are heavy smokers. The longest duration of smoking is 29 years, and the shortest duration is 12 years, counted since the first time until the research was held.

Enough exercise habits (>3 times a week with 30 minutes duration) is only done by small number of respondents, 5 respondents (12.8%), compared to lack of exercise habits (<3 times a week with 30 minutes duration) that is done by 34 respondents (87.2%). Meanwhile, drinking habits is constantly answered in never category by the respondents.

Workload

Descriptively, physical workload in this research is categorized as light (61.5%). Based on the mental workload score category distribution, the highest score is the respondents' percentages who have moderate and heavy mental workload category (91.4%).

Work Stress

Working stress of respondents is mostly found on moderate category (75.4%).

Metabolic Syndrome and Its Components

The research finding about metabolic syndrome on obese male employees by Fitria Nurjanah and Katrin Rosita (2015) shows that metabolic syndrome indicators dominantly found are abdominal obesity (96.5%), followed by hypertriglyceridemia (82.76%) and low HDL cholesterol (72.41%)[13].

Metabolic syndrome percentage (12.8%) in this research is still lower than world metabolic syndrome prevalence (20-25%)[3]. It was enough to be a sign that should be a warning. Compared to the world prevalence, is related to the field work of the respondents which is mostly government employees in administrative works. The finding of metabolic syndrome case on employees who mostly do administrative work should only have a low chance and can be controlled by having a healthy lifestyle. This analysis is based on the result of logistic regression analysis on United States workers which found that, workers in transportation field have more chance to meet the metabolic syndrome criteria than administrative, executive, and managerial workers [14].

Relation Test Result between Life Style, Workload, and Working Stress, with Metabolic Syndrome

The table 1. show that the variable of metabolic syndrome is significantly related to frequency of fruits consumption. It can be seen from the P-value score of fisher relation test (0.047), is bigger than 0.05. The coefficient correlation of both variables is 0.350, there is a positive correlation with a weak correlation.

Based on the cross table between fruits consumption variable and metabolic syndrome case, the percentage of fruits consumption frequency that has metabolic syndrome on the category 3 times/day/less is 25% bigger from the total of respondents in the category. Compared to the fruits consumption frequency that has metabolic syndrome on the category >3 times/day or 1-3 & > 3 times/week which is 0% of the total of respondents in the category.

In line with Setayeshgar (2014) which also study about food consumption factor with metabolic syndrome on Canadian, found that fruits and vegetables consumption was related with the metabolic syndrome indicator, which is abdominal obesity15.

Fruits are full of micronutrients such as vitamin that acts as antioxidants. These antioxidants are Vitamin A, C, and E. Antioxidant is a compound that can neutralize the unstable free radical molecules produced by many normal body chemical process, or by sun's radiation,

cigarrate smokes, and other environmental influences16.

In the body, the majority of free radicals are produced by complex chemical process when oxygen is used inside the cells. The free radicals that is chemically incomplete can "steal" particles from other molecules to produces abnormal compounds and makes chain reactions that can damage cells, by making fundamental changes on genetic materials and other important parts of the cells16. The free radicals can be suppressed by giving a combination of Vitamin E and Vitamin C. Vitamin C suppress free radicals that is dissolved in water, while Vitamin E can hamper the chained oxidation reaction of LDL17. Vitamin C also can decrease high serum triglycerides level that contributes in the occurrence of cardiac disease18.

Park S (2015) found that consumption of Vitamin A and C, and also moderate and high fruits consumption are able to decrease metabolic syndrome case on women from general population in South Korea19. It is supported too by Niazi SH (2014) research that among certain fiber sources, fruits fiber has protection effect against MetS risks20.

Table 1. Relation Test Result

Variables			Metabolic Syndrome	
			p-value	r-value
Workers Characteristics		Age (year)	0,636	0,126
		Gender	0,661	0,086
		Hereditary Hypertension	1,000	0,008
		Hereditary Diabetes Mellitus	0,661	0,086
Lifestyles	Diet	Total Food Calorie	-	-
		Food Types	0,139	0,276
		Eating frequency Staple	1,000	0.089
		Eating frequency Side dish	1,000	0,089
		Eating frequency Vegetables	1,000	0,028
		Eating frequency Fruits	**0,047**	**0,350**
		Eating frequency Snacks	0,125	0,091
	Consumption levels	Consumption level of Protein	1,000	0,020
		Consumption level of Fats	1,000	0,129
		Consumption level of Carbohydrate	1,000	0,089
	Smoking Habits	Smoking Status	1,000	0,005
		Smoking Frequency	1,000	0,049
		Smoking duration	1,000	0,049
	Drinking Habits		-	-
	Exercise Habits		1,000	0,145
Work load		Physical Workload	1,000	0,012
		Mental Workload	0,072	0,352
Work Stress			1,000	0,020

CONCLUSION

Most of respondents aged more than 40 years old are 25 people, the food types eaten is mostly complete (staple, side dish, vegetables, fruits, and snacks), the major frequency of the food consumption (staple, side dish, vegetables, fruits and snacks) is or less than 3 times a day, and generally the total calorie consumption is less, the level of protein, fats, and carbohydrates consumption is very low.The majority of the respondents have the risk of hereditary hypertension and diabetes mellitus, most of them are not smoker, and the respondents who smoke are only light smokers with at least 12 years duration of smoking, in general the respondents have less frequent exercise habits, and all the employees do not have ost of the respondents measured are having light workload but some of them feel moderate to heavy mental workload, and majority of them feel moderate working stress.

The lack of fruits consumption can contribute the metabolic syndrome case on government employees.

Conflict of Interest: None

Source of Funding: Department of Occupational Health and Safety, Public Health Faculty, Airlangga University, Surabaya, Indonesia

Ethical Clearance: The research proposal has been approved by Health Research Ethical Commission of Public Health Faculty Airlangga University, number: 120-KEPK. All respondents were given explanation and information about the purposes and methods of the research, and also had signed informed consent forms.

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A Study of Biochemical Changes among Elderly Attending a Tertiary Care Center

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ABSTRACT

Introduction: This century has seen longevity as a silent revolution. With alarming rise in the population of the world; increasing from 5.7 billion in 1995 to reach a 10.8 billion by 2050. In India, the grey population just doubled in less than 25 years. During ageing there are lots of changes occurring in the body; more so in the biochemical parameters. Hence this study was planned to elucidate the pattern of changes among the elderly population attending a tertiary care hospital. **Materials and method:** A cross-sectional hospital record based study was conducted to elucidate the biochemical changes occurring in geriatric population, which included hundred patient records comprising of equal proportion of females and males above the age of 60 years. **Results:** The study participants had mean age of 64 + 2 years. The socio demographic features were that majority (93%) belonged to the class I & II according to the modified B. G. Prasad Classification. Majority (61%) were hypertensive, 40% were Diabetic, 40% were obese and few of them (1-2%) were found to have hypothyroidism, Gout and liver disorders. Females had significantly high amount of HDL cholesterol. The diabetics had low HDL, the Impaired Glucose Tolerance and hypertensive had high levels of triglycerides. **Conclusion:** Significantly high HDL levels were found in women and normal glucose tolerance individuals, high triglycerides were seen in individuals with Impaired Glucose Tolerance and hypertension. Larger studies are required to see the significance of this form of distribution. Regular health check-ups must be encouraged to see the age related changes in the various parameters to ascertain factors that have an impact on the healthy living of this vulnerable group of individuals.

Keywords: *Geriatric health, Biochemical changes, Hypertension, Diabetes, Tertiary care institution.*

INTRODUCTION

This century has been witness to a silent revolution unseen, unheard and yet so close; longevity the name of it. Life expectancy is rising globally; the projected world population which was 5.7 billion will rise to reach 10.8 billion by 2050[1,2]. Greater than two third are in the developing countries such as India. The world is going through three major socioeconomic challenges which are global warming, terrorism and never the less, ageing[3]. The ageing is a process which happens to be a natural, nonreversible and not amenable to treatment. World health day 2012 had declared theme for the year as aging and health with a slogan of Good health adds life to years[4]. Ageing needs to be nurtured, cared for and prolonged. There are many changes occurring in the body the structural, functional and the biochemical parameters[5]. The structural and functional changes are evident by the signs of ageing however the biochemical changes are those that need to be studied by application of tests. Unfortunately socially, psychologically and physically the old are the most vulnerable population of the society; their access to tests and care is limited[6]. Despite the changes in structural and functional level changes that are studied it was thought to construe the changes in the biochemistry with respect to age and disease status[7]. The study is one such of its kind which

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observes the changes in the lipid profile and the hormonal trends among individuals attending the out-patient care facility of a tertiary care institution.

MATERIALS AND METHOD

This cross-sectional, hospital record based, observational study that was approved by the hospital ethics committee and was conducted at a tertiary care hospital. Then subsequently the Medical Record Department (MRD) was contacted to allocate the randomly numbered files from the hospital records for the past three months who have visited the hospital during the same period for review or consultation. From those case files the information was collected from the case record form that was filled in each file at the time of registration.

Inclusion Criteria:

This study included individuals aged 60 years and above, whose file is complete and had investigations record in the past 3 months.

Exclusion Criteria:

Individuals whose files were not available or were not completely filled or were undergoing treatment in the hospital at the time of study were excluded.

The patient's confidentiality was maintained at all levels during gathering of the information. The tests were done on Dimensions RxL Max Siemens machine. The Laboratory where the tests were run was NABL accredited and the care institution was JCI accredited. The investigation details were retrieved from the central lab registry based on unique ID ascribed to the patient file. This data was then compiled and tabulated and presented as percentages. Appropriate tests were applied based on the data collected and the level of significance was kept at 0.05.

RESULTS

The study included 100 patient records with equal proportion of males and females which satisfied the inclusion and exclusion criteria. The average age of study participants observed was 64 + 2 years; where majority (53%) were in the age group 60-65 years in contrast to the 70 years and above comprising only 3%. Their socio economic status derived according to the modified B. G. Prasad scale showed that 55% belonged to the class I followed by 38% in class II. Education among the study population was observed to be good with no illiterates and majority (83%) had attained graduation and above level of education. In the study group, 51% belonged to the nuclear family type and 29% were having a three generation type with declining joint family seen only among 20% participants. Majority (83%) were leading a retired life with just 17% still working. Morbidity pattern among them showed that Hypertension being found in 61%, Diabetes in 40% and obesity in 41% of the people; however a few had more than one disease such as hypothyroidism, Gout and liver damage which was confined in one to two percent. Lipid profile investigations that were done in these individuals were categorized in groups based on gender, glucose tolerance and hypertension. It was seen that females had higher HDL in comparison to males which was statistically significant. Similarly, among the Impaired Glucose Tolerance and the non-diabetic people it was observed that between them Diabetics had low HDL and high Triglycerides, this pattern of distribution was found to be statistically significant. Since in the diabetic and the non-diabetic the HDL was significantly low this distribution as well was also seen to be statistically significant in distribution. In the Hypertensive and the Normotensive, the triglyceride was high among hypertensive which was seen to be statistically significant. The remaining parameters such as total cholesterol, Low density Lipoproteins, Total cholesterol to High density Lipoproteins, ratio were found to be not distributed statistically significant among these groups. Thus, showing the importance of certain fractions of lipids and their distribution pattern in the elderly in line with the commonly prevalent diseases in them.

Table 1: Socio-demographic variables of the study individuals.

Variable	Male n=50 (%)	Female n=50 (%)	Total N=100 (%)
Age in years			
-60-65	23 (46)	30 (60)	53 (53)
-66-70	25 (50)	19 (38)	44 (44)
-Above 70	02 (04)	01 (02)	03 (03)
Socio economic status (Modified BGP)			
-Class I	30 (60)	25 (50)	55 (55)
-Class II	20 (40)	18 (36)	38 (38)
-Class III	00 (00)	07 (14)	07 (07)
-Class IV	00 (00)	00 (00)	00 (00)
-Class V	00 (00)	00 (00)	00 (00)
Education			
-Graduate and above	44 (88)	39 (78)	83 (83)
-Secondary school & PUC	05 (01)	08 (16)	13 (13)
-Primary school	01 (02)	03 (06)	04 (04)
-Illiterate	00 (00)	00 (00)	00 (00)
Family status			
-Nuclear family	31 (62)	20 (40)	51 (51)
-Joint family	05 (01)	15 (30)	20 (20)
-Three generation	14 (28)	15 (30)	29 (29)
Occupation			
-Working	12 (24)	05 (10)	17 (17)
-Retired	38 (76)	45 (90)	83 (83)

Table 2: Distribution of diseases among the Elderly

Variable	Male n=50 (%)	Female n=50 (%)	Total N=100 (%)
Hypertension			
-Hypertensive	30(60)	31(62)	61(61)
-Non hypertensive	20 (40)	19 (38)	39 (39)
Diabetes			
-Non Diabetic	15(30)	23(46)	38 (38)
-Impaired Glucose Tolerance	12(24)	10(20)	22(22)
-Diabetic	23 (46)	17 (34)	40 (40)
Obesity (BMI) Kg/m^2			
< 18.5	00(00)	00(00)	00 (00)
18.50 – 22.9	04(08)	04(08)	08 (08)

Cont... **Table 2: Distribution of diseases among the Elderly**

23.00 – 24.9	26(52)	25(50)	51 (51)
≥ 25.00	20 (40)	21 (42)	41 (41)
Others			
-Hypothyroidism	00 (00)	02 (04)	02 (02)
-Gout	00 (00)	01 (02)	01 (01)
-Alcoholic liver disease	01 (02)	00 (00)	01 (01)

Table 3: Lipid Profile among the various classes and its significance

Variable	Total cholesterol			HDL			LDL			TG			TC/HDL ratio		
	Mean	SD	P value	Mean	SD	P Value	Mean	SD	P Value	Mean	SD	P value	Mean	SD	P value
Male N=50	183.7	39.4	0.07	39.9	8.2	0.00*	116.5	32.4	0.18	136.6	88.2	0.79	4.4	1.3	0.21
Female N=50	197.5	38.0		45.7	10.7		125.2	31.9		132.7	54.3		4.5	1.0	
Diabetic N=40	185.8	40.0	0.82	40.5	8.6	0.03*	117.0	31.0	0.84	141.2	90.8	0.21	4.7	1.1	0.17
Non Diabetic N=38	187.6	30.3		45.4	11.0		118.4	28.9		119.3	60.1		4.4	1.2	
Impaired Glucose Tolerance N=22	204.4	48.7	0.11	42.8	9.6	0.03*	132.0	38.5	0.12	149.5	51.5	0.05*	4.8	1.0	0.17
Non Diabetic N=38	187.6	30.3		45.4	11.0		118.4	28.9		119.3	60.1		4.4	1.2	
Hypertensive N=61	192.7	42.4	0.5	42.3	8.66	0.5	121.1	35.9	0.9	146.7	80.4	0.03*	4.7	1.2	0.49
Normotensive N=39	187.3	33.6		43.7	11.7		120.5	26.1		115.9	55.3		4.5	1.1	

* Shows that the value is statistically significant at < 0.05 level.

DISCUSSION

The study has seen the significance of lipid parameters in the elderly which were the most commonly prescribed tests. In randomly selected 100 subjects with equal distribution of males and females the mean age was 64+ 2 years. This was seen to be similar with findings of Jaiganesh[4]. Al Modeer found 8.5% in 60-69 years age group whereas our study had most 97% in this age group. This may be attributed to the hospital based study where the patients are attending on their own[6]. The socio economic status was found to be higher as compared to the other studies as our study was done in the tertiary care setup hence the scope of skewness in data. Literacy status as well remained high as compared to other studies in line with findings of martin V M et.al. which may be as well attributed to the study setting [7]. The disease commonly found in our study were hypertension and diabetes 61% and 62% respectively and this was consistent with the findings in other studies[8,9]. Other diseases were found to be in 2% similar to findings in other studies[10].The higher levels of HDL cholesterol was found to be associated with females, in healthy individuals and Heptagenerians (70 years and above) seen similarly in other studies[12]. Hypertension was associated with high triglycerides as seen in other studies[12]. The elderly in our study had higher BMI which may be due to higher socioeconomic status and it was found to be similar to other studies [13,14].

CONCLUSION

Significantly high HDL levels were found in women and normal glucose tolerance individuals, high triglycerides were seen in Impaired Glucose Tolerances and in hypertensives. Thus showing the role of lipids in disease causation. This aspect further need to be evaluated by larger studies which are required to see the significance of this form of distribution. Geriatrics must be encouraged to have regular checks to see the age related changes in the various parameters to ascertain factors that have an impact on the healthy living of this vulnerable group of individuals.

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A Study on Awareness and Attitude about Organ Donation among School Teachers

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ABSTRACT

Organ transplantation is the last resort of saving lives in accident cases and prolonging life in many disease cases where chronic organ failure cannot be cured. However, lack of availability of organs is the main problem in this modality of treatment. In India every year nearly 500000 people die because of non availability of organs, 200000 people die liver disease, 50000 people die of heart disease. 150000 people await kidney transplant, but only 5000 get one. 1000000 people suffer from corneal blindness and await transplant . In view of the "The transplantation of human organs act", passed in 1994 , voluntary donation remains the only way for availability of the organs. Willingness rate of Indians to donate organs is much lower (0.08 donors per million people) compared to other countries. Various studies among different population groups have shown varied levels of awareness about organ donation. In the present study among school teachers we found actual awareness differed from self perceived level of awareness. Awareness about the existing law (2%), cardiac death vis a vis brain death (10%) was the lowest among the variables considered. Attitude also varied when donation for own children and spouse was compared with that toward relatives and friends. Family was found to be an important factor to make an opinion to donate organs.

Keywords: *cardiac death, brain death, time for deceased donation, permission of spouse/children, Willingness, live donation*

INTRODUCTION

With the advent of medical sciences, organ transplantation has come up as an ultimate solution for saving life in many accident cases and prolonging and improving quality of life in various disease cases. In India every year nearly 500000 people die because of non availability of organs, 200000 people die liver disease, 50000 people die of heart disease. 150000 people await kidney transplant, but only 5000 get one. 1000000 people suffer from corneal blindness and await transplant [1]. To save these lives, physicians, scientists and transplant centres have continually experimenting with new technologies to increase the number of available kidneys [2].This demand is ever increasing, which can only be met by people's willingness to donate organs.

In the year 1994, the Government of India passed " The transplantation of human organs act" [3], making voluntary donation the only way for availability of the organs.

Willingness rate of Indians to donate organs is much lower. India is the second most populous country of the world after China with an estimated population of 1.2 billion. Unfortunately, when it comes to organ donation it is one of the lowest ranked nations with 0.08 donors per million people. Countries like USA and UK have 10 to 30 donors per million populations. Some smaller countries like Singapore, Belgium, and Spain are doing still better having a staggering statistics of 20 to 40 donors per million [4][5]. India is currently having deceased donation rate of 0.05-0.08/million population compared to rate of 20/million in Spain, US and France[3]. However there is an improving trend of late. Sumana et al[6] reported a total 530 organs retrieval from 196 multi-organ donors in 2012 resulting in a national organ donation rate of

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0.16 per million populations.

Performance of Uttar Pradesh in organ donation/ transplant is one of the lowest in India. In 2014 only 7 organ donation with the donation rate of 0.04 per million populations was reported[6].

In India there is a lack of studies on awareness and attitude of the people about solid organ donation.[3].

MC Mishra , chief of the Jai Prakash Narayan Apex Trauma Center at the All India Institute of Medical Sciences, Delhi is of the opinion that number of willing donors in India is still very dismal in spite of amendment of law in this regard in 2008[5]. In India 200000 kidneys 100000 livers are needed every year against 2-3% of the requirement getting fulfilled[7]. With such a gap between requirement and availability, increase in awareness and motivation among general populations can help solve the problem.

With such an issue in mind it was decided to conduct a survey among school teachers in Meerut city to assess the awareness and attitude of the teachers toward organ donation.

METHODOLOGY

A descriptive cross sectional, study among teachers of three private schools in Meerut city was designed. 100 study subjects were selected from those teachers who were willing to participate, through a purposive sampling. The schools were among those in which school health examination is carried out by the Community Medicine Department of our college.

Verbal consent from the Principals was obtained.

A questioner was prepared which included common and relevant aspects of awareness of non medical persons about organ donation. Data was collected by handing over the questionnaire to the teachers assembled in a hall in their school on pre determined day and time agreed upon by the Principal.

Collected data was studied and analysed in Microsoft Excel and SPSS version 19.

RESULTS AND DISCUSSION

TABLE1: SOCIO DEMOGRAPHIC PROFILE

VARIABLES		**FREQ-UENCY**	**%**
AGE	21-30 YEARS	49	49.0
	31-40 YEARS	33	33.0
	41-50 YEARS	14	14.0
	51-60 YEARS	2	2.0
	61-70 YEARS	2	2.0
GENDER	FEMALE	83	83.0
	MALE	17	17.0
EDUCATION	GRADUATE	47	47.0
	POST GRADUATE	53	53.0
TOTAL		**100**	**100.0**

TABLE 2: AWARENESS OF ORGAN DONATION

VARIABLES		FREQ	%
OWN PERCEPTION	INADEQUATE KNOWLEDGE	39	39.0
	NO KNOWLEDGE	4	4.0
	ADEQUATE KNOWLEDGE	57	57.0
NAME OF THE ORGAN THAT CAN BE DONATED	BONES	2	2.0
	CORNEA	91	91.0
	DON'T KNOW	5	5.0
	HEART	54	54.0
	KIDNEY	68	68.0
	LIVER	29	29.0
	LUNGS	17	17.0
ORGAN DONATION HAS ANY AGE LIMIT OR NOT	NO	37	37.0
	YES	63	63.0
ABOVE ANSWER IS YES, THEN MENTION THE AGE LIMIT	DON'T KNOW	6	6.0
	MORE THAN 18 YEARS	52	52.0
	MORE THAN 35 YEARS	1	1.0
	MORE THAN 50 YEARS	2	2.0
	MORE THAN 65 YEARS	2	2.0
	NO AGE LIMIT	37	37.0

Cont... **TABLE 2: AWARENESS OF ORGAN DONATION**

WHO CAN DONATE AN ORGAN	ANY PERSON	52	52.0
	DON'T KNOW	8	8.0
	ONLY HEALTHY PERSON	40	40.0
IDEA ABOUT BRAIN DEATH	CORRECT	15	15.0
	DON'T KNOW	60	60.0
	INCORRECT	25	25.0
PERMISSIBLE TIME LIMIT OF ORGAN RETRIEVING AN ORGAN FROM DEAD BODY	2 HOURS	24	24.0
	24 HOURS	15	15.0
	DEPENDS ON ORGAN	11	11.0
	DON'T KNOW	50	50.0
KNOWLEDGE ABOUT DIFFERENCE BETWEEN CARDIAC DEATH AND BRAIN DEATH	CORRECT	10	10.0
	DON'T KNOW	62	62.0
	INCORRECT	28	28.0
KNOWLEDGE ABOUT DIFFERENCE BETWEEN LIVE DONATION AND DECEASED DONATION	CORRECT	10	10.0
	DON'T KNOW	86	86.0
	INCORRECT	4	4.0
COMPENSATION MONEY FOR DONOR	DON'T KNOW	38	38.0
	NO	17	17.0
	YES	45	45.0
NAME OF THE LAW REGULATING ORGAN DONATION IN INDIA	PERMITTED	2	2.0
	DON'T KNOW	94	94.0
	NOT PERMITTED	4	4.0
MAIN PROVISIONS OF THE LAW	AWARE	2	2.0
	DON'T KNOW	91	91.0
	INCORRECT	7	7.0
REQUIREMENT OF CONSENT OF FAMILY TO RETRIEVE ORGAN FROM A DEAD BODY	DON'T KNOW	33	33.0
	NOT REQUIRED	3	3.0
	REQUIRED	64	64.0
ELIGIBILITY OF MINOR TO PLEDGE	DON'T KNOW	40	40.0
	NO	31	31.0
	YES	29	29.0
CONSENT OF SPOUSE FOR PLEDGING	DON'T KNOW	7	7.0
	NOT REQUIRED	18	18.0
	REQUIRED	75	75.0
DONATION WITHOUT PERMISSION OF INSURANCE COMPANY	DON'T KNOW	19	19.0
	NOT PERMITTED	45	45.0
	PERMITTED	36	36.0
EFFECT ON LIFE INSURANCE FOR DONATING ORGAN WITHOUT INFORMING THE LIFE INSURACE COMPANY	AWARE	20	20.0
	DON'T KNOW	74	74.0
	INCORRECT AWARENESS	6	6.0
AGENCY TO BE APPROACHED FOR PLEDGING ORGAN DONATION	CORRECTLY KNOW	5	5.0
	DON'T KNOW	91	91.0
	INCORRECTLY KNOW	4	4.0
TOTAL		**100**	**100.0**

TABLE 3: ATTITUDE TOWARD ORGAN DONATION

VARIABLES		**FREQ**	**%**
ALLOWABILITY BY RELIGION	**DON'T KNOW**	4	4.0
	NOT PERMITTED	14	14.0
	PERMITTED	82	82.0
WILLINGNESS TO DONATE ORGAN AFTER DEATH	**INDECISIVE**	5	5.0
	NO	31	31.0
	WILLING	64	64.0
IF ANSWER IS YES THEN WILLINGNESS TO PLEDGE ORGAN DONATION	**NO DONATION**	36	36.0
	INDECISIVE	33	33.0
	NO	6	6.0
	YES	25	25.0

Cont... **TABLE 3: ATTITUDE TOWARD ORGAN DONATION**

WILLINGNESS TO CONSULT FAMILY MEMBERS BEFORE PLEDGING	**INDECISIVE**	11	11.0
	NO	9	9.0
	YES	80	80.0
WILLINGNESS TO RECEIVE AN ORGAN DONATED BY OWN LIVING CHILD	**INDECISIVE**	8	8.0
	NO	61	61.0
	WILLING	31	31.0
WILLINGNESS TO DONATE AN ORGAN DURING LIFE TO OWN CHILD/ HUSBAND/WIFE	**INDECISIVE**	3	3.0
	NO	2	2.0
	YES	95	95.0
WILLINGNESS FOR LIVE DONATION, TO OWN PARENTS ABOVE 60 YEARS OF AGE	**INDECISIVE**	3	3.0
	NO	12	12.0
	YES	85	85.0
WILLINGNESS FOR LIVE DONATION TO RELATIVES	**INDECISIVE**	4	4.0
	NO	56	56.0
	YES	40	40.0
WILLINGNESS FOR LIVE DONATION , TO FRIENDS	**INDECISIVE**	3	3.0
	NO	59	59.0
	YES	38	38.0
WILLINGNESS FOR LIVE DONATION, TO UNACQUAINTED PERSONS	**INDECISIVE**	4	4.0
	NO	62	62.0
	YES	34	34.0
WILLINGNESS FOR LIVE DONATION AGAINST THE WISH OF OWN SPOUSE/ CHILD	**INDECISIVE**	5	5.0
	NO	44	44.0
	YES	51	51.0
WILLINGNESS TO ACCEPT COMPENSATION MONEY, AGAINST LIVE DONATION	**INDECISIVE**	13	13.0
	NO	57	57.0
	YES	30	30.0
WILLINGNESS TO DONATE YOUR ORGAN FOR MONEY, IN THE TIME OF FINANCIAL CRISIS	**INDECISIVE**	1	1.0
	NO	61	61.0
	YES	38	38.0
WILLINGNESS TO BUY AN ORGAN, FOR OWN CHILD/SPOUSE	**INDECISIVE**	5	5.0
	NO	27	27.0
	YES	68	68.0
WILLINGNESS TO BUY AN ORGAN, FOR OWN PARENTS ABOVE 60 YEARS AGE	**INDECISIVE**	4	4.0
	NO	35	35.0
	YES	61	61.0
WILLINGNESS TO BUY AN ORGAN, FOR A RELATIVE	**INDECISIVE**	11	11.0
	NO	30	30.0
	YES	59	59.0
WILLINGNESS TO BUY AN ORGAN, FOR A FRIEND	**INDECISIVE**	12	12.0
	NO	28	28.0
	YES	60	60.0
	TOTAL	**100**	**100.0**

DISCUSSION

In a country where organ donation of voluntary nature only is permitted, people's willingness to donate organ is the pivot of treatment by organ transplantation. It is a general rule that education level should bear a positive effect on people's awareness and attitude. So to find out the awareness among educated people, teachers of more than one school were selected for the study. 53% of the study subjects were post graduate with 40% graduates. Number of female teachers was significantly higher (83%) than the males (17%), This was due to the natural gender difference seen among school teachers these days. All the study subjects were Hindus.

When asked, 57% respondents believed that they had adequate knowledge about organ donation with 39% admitting inadequate knowledge. This finding was similar to that of Ilango et al [8]. In another study [9] among six hundred thirty six select populations which included office goers of Delhi, class 12 school children of a public school and villagers, Wig et al found that overwhelming majority of the respondents had heard about organ transplantation. In a community based study in Pondicherry[3] it was found that 88% have heard about organ donation. In another study among rural population in India Krishnaiah [10] et al found that of those aware of eye donation, 32.9% were willing to pledge, and 50.6% more information to decide whether or not to pledge their eyes. In another study among

general populations Vijaylakshmi et al [11] found that 93.8% were aware and 52% had adequate knowledge about organ donation. In another study among health workers, Ahlawat et al [12] found that only 15% of the participants had no or incomplete knowledge about organ donation programme in the hospital. Regarding the particular organs those can be donated, awareness level was highest for cornea (91%), followed by kidney (68%) and heart (54%). No one mentioned about bone marrow, pancreas and blood. In a community based study [3] almost all the subjects felt that eyes could be donated after death, an almost similar to our findings, whereas only 3% felt that other organs like kidney, heart could also be donated, indicating better awareness of our study subjects in this regard. In a community based study Balajee et al [3] found that among the participants who perceived that organs could be donated after death, 39% responded that all organs could be donated. 63% of the study subjects were aware of the age limit of the donor. 52% knew that individuals above 18 years only could donate organ. Only 40% study subjects opined that only healthy persons can donate organs against 52%, who thought that any one irrespective of health status, could donate organs. Regarding allowable time for cadaveric transplantation, 50% subjects were not aware of it. 11% opined it depends on the particular organ. Only 24% responded that it should be done within 2 hours. A better awareness level in this regard was found in a community study [3] where 85% of the participants responded that organ donation should be done immediately after death.

Only 10% of the respondents stated that they knew the difference between cardiac and brain death against 62% admitting no knowledge and 28% had incorrect knowledge. It was found that the subjects' knowledge about live and cadaveric donation was poor with 86% did not know the difference and 10% correctly knowing this. In another study [8], 57% of the nursing students, 63.4% medical students, 66.6% dental students had the correct knowledge about various aspect of brain death. In our study the respondents are non medical persons. Hence difference is not unusual.

Regarding awareness about compensation money, only 17% of the respondents were aware of the fact compensation money for organ donation cannot be paid, 45% were of the impression that such compensation money is permissible and 38% did not know anything about it. In a study [8] among medical , dental, nursing students this awareness level was found to be higher 49.6%, 48.1%, 42% respectively. Respondents in our study being nonmedical persons such difference is not unusual.

Regarding existence of a law regulating organ donation in the country, again respondents' awareness was very poor with 94% admitted they did not know the name of the law and only 2% knew the name of the law with it's main provisions.

Regarding permission of family members, 64% said that it is procedural requirement for retrieval of organ(s) from a dead body. 33% admitted that they did not know whether such permission is required and only 3% were of impression that such permission is not required. Only 31% said that a minor can't pledge for organ donation and 40% admitted their ignorance on this. 7% of the subjects did not know as to whether permission of the spouse is required for one to pledge organ donation against 75% opining it as required and 18% saying not required. When asked about the requirement of obtaining permission from insurance company, 36% said it is required and 45% opined it as not required with 19% admitting their ignorance. 20% of the subjects correctly knew that consequences of organ donation without the permission of insurance company with 74% admitting ignorant of the consequences in such a circumstance.

Regarding who to approach for organ donation 91% subjects were not aware of the agency/authority to approach for pledging donation. Only 5% had correct knowledge about it. Whereas in a telephonic survey in southern Oranto, 62% of the respondents stated that they had signed for Donor card and 80% of the respondents said that organ donor card should be a legal document[3]. This indicated huge difference in awareness and attitude level between the respondents of that study and ours.

Regarding restriction put by religion, 82% subjects said that there is no restriction in their religion to donate organ with 14% saying it is not permitted in their religion. Inter religion difference could not be studied since all respondents in our study belonged to same religion. In a study [12] Ahlawat et al religious belief has a positive influence on attitude of organ donation. This observation more or less matches with our findings.

When asked about willingness to donate organ after death, 64% expressed their willingness against 33% unwilling and 5% indecisive. This finding was more or less similar to the findings of Balajee et al [3] who

found 70% of participants were willing to donate organs after death. In a survey in southern Oranto 80% of the respondents were found to be willing to donate organs and those of next of kin, after death [12]. However, as per experiences of Mohan Foundation people are generally unwilling to donate organ(s) of a brain death person. In India deceased deceased donation is now responsible for 40% of the liver and 15% of kidney transplant [6]. On the issue of pledging, willingness percentage decreased to 25% with 33% were indecisive. In India Family plays an important role in decision making. In our study also we find the same. I 80% of the subjects admitted that they would like to consult family members before pledging. Ahlawat et al[12] found attitude of the spouse influence the willingness of organ donation. In a study among general population, Vijaylakshmi et al [11] found that while 93.8% were aware of organ donation and 76.2% supported organ donation, only 62.2% were willing to donate organs after death.

Parental love and affection and family ties played an important role on the issue of receiving live donation from own children and vice versa. 61% declared they would not receive a live donation from own children. 95% expressed willingness to donate live for their children or spouse. However, 31% expressing willingness to receive live donation from own children remained intriguing. Coming to the issue of live donation for parents above 60 years, 85% expressed willingness which was considered a reasonably high on attitude level, though little lower in comparison with children and spouse. The willingness of live donation for relatives was lower to 40% with 56% expressing unwillingness. Live donation willingness for friends were found to be more or less similar to that for the relatives ie. 38% willing and 59% unwilling. Lesser number of the respondents were willing for live donation for an unacquainted person, with 34% willing and 62% unwilling. 51% of the subjects admitted that once decided they would not mind to donate live against the wish of spouse and children against 44% stated not to do so. This indicated that half of the all respondents were of the opinion to give primacy on personal considered view over that of family members in displaying a strong positive attitude toward live donation.

Regarding acceptance of money against organ donation, 57% said they would not do so while 30% admitted willingness. 61% stated unwillingness to live donation against money even in financial crisis situation while38% expressing intent of do so.

68% respondents stated that they would be willing for paying money when their children or spouses would need a live donation, against 27% expressing unwillingness for such buying an organ. Such willingness was found to be decreased to 61% for the parents above 60 years age. Willingness to pay money for live donation in respect of relatives and friends was even lower to 59% and 60% respectively.

CONCLUSION

Study subjects' awareness level was lower than that in western countries. Actual awareness level was much lower than self assessment. They were almost ignorant about the registering with agencies for pledging donation after death.

Willingness for deceased donation was much higher than live donation.

Attitude toward organ donation (live) for own children and spouse was high whereas the same was much lower when it involves relatives and friends. Willingness for live donation for unacquainted person was low.

Widespread awareness campaign is a need of the hour. A health programme on the topic will go a long way for Organ transplantation to pick up the momentum in the country.

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Assessment of Physical Activity and Dietary Pattern among Adults in Rural Mangalore

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ABSTRACT

Introduction: The increase in morbidity and mortality due to NCDs are mostly due to change in lifestyle leading to consumption of unhealthy diet and reduced physical activities. **Objectives:** To assess the magnitude of association between socio-demographic characteristics & BMI with physical activity and dietary pattern among adults. **Materials & Method**: A cross-sectional study was conducted in rural Mangalore using IPAQ (short version) & Indian equivalent DASH diet on 2000 calorie plan. 130 subjects were studied by simple random sampling. Chi square test was used to test the significance (P<0.05). **Results:** 61(47%) were males and 69(53%) were females, majority 42.3% belonging to class IV of Modified B.G Prasad classification and 27.7% were illiterates. Females had lower physical activity compared to males (p=0.009) and individuals with BMI indicating over weight and obese had low physical activity compared to subjects with normal BMI with moderate physical activity (p=0.02). Individuals from class V SES classification consumed at least 1 fruit per week (20.0%) compared to class III who did not consume fruits (8.5%) at all (p=0.043). Individuals who consumed >5 bowls of fats and oils were more obese and overweight compared to individuals who consumed 1-2 bowls (p=0.001). **Conclusion:** Socio-demographic characteristics play a major role in diet & physical activity in rural Mangalore. The focus should not only be on individual health education but also on health promotive lifestyles.

***Keywords**: physical activity, diet, obesity, India, sedentary behaviour*

INTRODUCTION

The major risk factor for the development of most NCDs is the adaptation of the people to sedentary lifestyles and unhealthy dietary practices. Globally, out of 56 million deaths in 2012, 38 million were due to NCDs, principally diabetes, cardiovascular diseases, cancer and chronic respiratory diseases[1]. In recent years, physical activity has become an important public health issue in both high and low-income countries [2, 3]. According to the Global Burden of Disease study age-standardized estimates (2010), nearly a quarter (24.8%) of all deaths in India is attributable to CVD[4]. Among all the risk factors of NCD, unhealthy dietary practices, sedentary lifestyle and obesity have emerged as major risk factors[5].

Low socio economic status is associated with increased risk of cardiovascular diseases[6]. Protective lifestyle factors such as physical activity and regular intake of fruits and vegetables were markedly lower among south Asians than western population[7]. A study done at Tamil Nadu stated that low physical activity was seen among 63% of the urban and 43% of the rural population and consumption of fruits and vegetables were equally poor in both[8], whereas in a study done at Punjab revealed that there is no rural urban difference except the fact that a significantly higher proportion of respondents belonging to rural area (15.6 %) always/ often add salt before eating as compared to urban area (9.1 %) and overall, 95.8 % of participants took less than

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5 servings of fruits and/or vegetables per day[9].

Thus, it is important to understand the pattern of association between the socioeconomic status and possible risk factors of NCDs to focus on health intervention and strategies that need to be formulated to prevent the epidemic of cardiovascular diseases.

AIMS AND OBJECTIVES

To assess the magnitude of association between socio-demographic characteristics & BMI with physical activity and dietary pattern among adults.

MATERIALS & METHOD

A community based cross sectional study was conducted in a rural area of Mangalore, Karnataka. House to house survey was done by selecting study subjects randomly by simple random sampling by a single interviewer. Based on a pilot study, 8% of people were reported to have unhealthy diet pattern, with 5% allowable error and using formula $4pq/d^2$ the sample size derived were 117. Totally 130 subjects were surveyed from January to February 2017. House list of the village was taken from the Anganwadi. Selection of households from the list was done by lottery method by simple random sampling and selection of the study subjects were prioritized as eldest. Each study subject was interviewed using the International Physical Activity Questionnaire (IPAQ) - short version[10] to evaluate the pattern of physical activity and an average MET Score was derived for each type of activity. The continuous score allows the estimation of the weekly energy expenditure expressed in weekly MET minutes or MET-min/week (MET = metabolic equivalents of task. This is obtained by the following method

Walking MET-Minutes/Week = 3.3*Walking Minutes*Walking Days

Moderate MET-Minutes/Week = 4.0*moderate-intensity activity minutes*moderate days

Vigorous MET-Minutes/Week = 8.0*vigorous intensity activity minute* vigorous days

Total physical activity MET-Minute/Week = sum of walking + moderate + vigorous METS-Minutes/Week scores.

The categorical score classifies individuals into three categories: 'low', 'moderate' and 'high'. The 'low' category includes those who do not perform any PA and those reporting some activity, but not enough to meet other categories.

The patterns of activity to be classified as 'moderately active' comprise the following criteria:

>3 d of vigorous-intensity activity of at least 20 min/d or

>5 d of moderate-intensity activity and/or walking of at least 30min/d or

>5 d of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum total PA of at least 600 MET-min/weeks.

Individuals meeting at least one of the above criteria would be defined as accumulating a minimum level of activity and therefore be classified as 'moderately active'.

The two criteria for classification as 'highly active' are:

Vigorous-intensity activity on >3 d achieving a minimum total PA of at least 1500 MET-min/week or

>7d of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum total PA of at least 3000 MET-min/week.

Indian equivalent DASH diet on 2000 calorie plan[11,12] to assess the dietary pattern among the study population. DASH diet means a diet rich in fruits, vegetables and low fat dairy products with reduced content of saturated and total fat. It has low quantities of sweets, fat, red meat and sugar containing beverages. Anthropometric measurements were taken by standard methods and BMI was calculated. Socioeconomic status of the study population was assessed by modified BG Prasad classification. All individuals above 40 years, who are permanent residents of that village and willing to participate were included in the study. Mentally unstable and moribund individuals were excluded. The operational definitions of one serving of fruits/vegetables and physical activity is considered according to **WHO STEPS Manual[13]**. According to Asia-Pacific guidelines of obesity classification, individuals will be considered as over-weight if BMI is more than $23kg/m^2$ and will be considered as obese if BMI is more than $25kg/m^2$.

The collected information was summarized by using

descriptive statistics such as frequency, percentage, mean and standard deviation. Chi square test (Inferential Statistics) was used for univariate analysis and p value < 0.05 was considered significant. Data management and analysis was done by using Microsoft excel and SPSS version 16.

This study had obtained the ethical clearance approval from the institutional ethical committee of K.S Hegde Medical Academy, Mangalore, Karnataka. Written informed consent was obtained from all study participants before eliciting the desired information.

RESULTS

A total of 130 individuals were studied of which 61(47%) were males and 69(53%) were females. Majority (52.3%) were in the age of 40 – 50 years, followed by 33%, 12.3% and 2.3% in the age group of 51 - 60 years, 61 – 70 years and > 70 years respectively. Most (42.3%) belonged to class IV of BG Prasad SES. 84.4% were Hindus, 12.3% were Muslims and 4.6% were Christian by religion. 17.7% were graduates and above, 27.7% were illiterates and 14.6% did intermediate/diploma. By occupation, 3.1% were professionals, 7.7% were semi-professionals, 28.5% were housewives, 22.3% were semiskilled workers, 6.9% were skilled workers, 10% were unskilled workers, 7.7% were retired and rest were unemployed.

Physical activity pattern: Based on the Total METS-Minute/week score, the categories were computed as below.

CATEGORY	N=130 (%)
LOW	50 (38.5)
MODERATE	72 (55.4)
HIGH	8 (6.2)

(Table 1) represents the association between socio demographic characteristics and Total METS category.

Dietary pattern:

The study revealed that 83.8% of people consumed 3 main meals per day and 39.2% consumed snacks once daily. Overall 42.3% of people consumed < 1 fruit per week and only 5% consumed > 3 fruits per week whereas 40% consumed 2-5 bowls of vegetables per week. 46.2% of individuals consumed pickle. It was observed that maximum of 35.4% of the families used 3 teaspoons of salt per day. 48.5% of individuals took no extra salt during meals whereas 40% took <1 teaspoon of salt and 11.5% took >1 teaspoon of salt. 76.2% consumed >500ml oil per month**. (Table 2)** shows the association between physical activity and diet pattern.

Individuals from class V SES classification consumed at least 1 fruit per week (20.0%) compared to class III who did not consume fruits (8.5%) at all (p=0.043), similarly 41.5% of subjects who consumed fruits in a week had normal BMI compared to 15.4% of individuals who had less consumption of fruits were recorded obese (p=0.015). Individuals who consumed >5 bowls of fats and oils were more obese and overweight compared to individuals who consumed 1-2 bowls (p=0.001). Illiterates (27.7%) consumed more cooked meat, fish and poultry per week than graduates and above (17%) which was significant (p= 0.008). Association between amount of sweets consumed per week and BMI recorded were strongly significant (p=0.003) and 33.1% of individuals who belong to class V consumed more fats and oil compared to class III individuals (24.6%) which was also significant (p=0.032).

TABLE 1: ASSOCIATION OF PHYSICAL ACTIVITY WITH SOCIO DEMOGRAPHIC CHARACTERISTICS (N = 130)

CHARACTERISTICS	LOW (%)	MODERATE (%)	HIGH (%)	X^2	P VALUE
AGE (YEARS) 40 – 50 51 – 60 61 – 70 >70	 24 (48) 14 (28) 10 (20) 2 (4)	 39 (54.2) 27 (37.5) 5 (6.9) 1 (1.4)	 5 (62.5) 2 (25) 1 (12.5) 0	6.512	0.368
SEX Male Female	 15 (30) 35 (70)	41 (56.9) 31 (43.1)	 5 (62.5) 3 (37.5)	9.432	**0.009**

Cont... **TABLE 1: ASSOCIATION OF PHYSICAL ACTIVITY WITH SOCIO DEMOGRAPHIC CHARACTERISTICS (N = 130)**

SES					
CLASS III	13 (26)	16 (22.2)	3 (37.5)		
CLASS IV	19 (38)	34 (47.2)	2 (25)	2.258	0.688
CLASS V	18 (36)	22 (30.6)	3 (37.5)		
EDUCATION					
Illiterate					
Primary (1 - 4)	19 (38)	15 (20.8)	2 (25)		
Middle (5 - 7)	5 (10)	8 (11)	1 (12.5)		
High (8 – 10)	3 (6)	10 (13.9)	0		
Intermediate/diploma	3 (6)	19 (26.4)	3 (37.5)		
Graduate & above	7 (14)	11 (15.3)	1 (12.5)	16.996	0.074
	13 (26)	9(12.5)	1 (12.5)		
MARITAL STATUS					
Unmarried	1 (2)	4 (5.6)	0		
Married	41 (82)	64 (88.9)	6 (75)		
Divorced	0	2 (2.8)	1 (12.5)	12.655	**0.049**
Widowed	8 (16)	2 (2.8)	1 (12.5)		
BMI					
Normal	14 (10.8)	34 (26.2)	6 (4.6)		
Over weight	21 (16.2)	33 (25.4)	2 (1.5)	17.177	**0.002**
Obese	15 (11.5)	5 (3.8)	0		

TABLE 2: ASSOCIATION BETWEEN PHYSICAL ACTIVITY AND DIETARY PATTERN (N = 130)

FOOD GROUPS SERVINGS/WEEK	**LOW (%)**	**MODERATE (%)**	**HIGH (%)**	**X^2**	**P VALUE**
Cooked grains					
1 -2 bowls	3 (2.3)	4 (3.1)	0		
2 – 5 bowls	21 (16.2)	33 (25.4)	4 (3.1)	0.690	0.953
> 5 bowls	26 (20.0)	35 (26.9)	4 (3.1)		
Fruits					
Not taking	23(17.7)	20 (15.4)	3 (2.3)		
<1 fruit	17 (13.1)	34 (26.2)	4 (3.1)		
1 – 2 fruits	10 (7.7)	13 (10.0)	1 (0.8)	8.371	0.212
>3 fruits	0	5 (3.8)	0		
Cooked meat/fish					
Not taking	5 (3.8)	3 (2.3)	3 (2.3)		
1 -2 bowls	8 (6.2)	15 (11.5)	0		
2 – 5 bowls	16 (12.3)	30 (23.1)	4 (3.1)	14.480	**0.025**
> 5 bowls	21 (16.2)	24 (18.5)	1 (0.8)		
Milk					
Not taking	9 (6.9)	10 (7.7)	1 (0.8)		
1 – 2 glasses	12 (9.2)	29 (22.3)	4 (3.1)		
2 – 5 glasses	18 (13.8)	19 (14.6)	1 (0.8)	5.127	0.528
>5 glasses	11 (8.5)	14 (10.8)	2 (1.5)		

***Cont...*TABLE 2: ASSOCIATION BETWEEN PHYSICAL ACTIVITY AND DIETARY PATTERN (N = 130)**

Nuts/ seeds					
Not taking	37 (28.5)	47 (36.2)	5 (3.8)		
1 – 2 bowls	11 (8.5)	24 (18.5)	2 (1.5)		
2 – 5 bowls	2 (1.5)	0	1 (0.8)	8.429	0.208
>5 bowls	0	1 (0.8)	8 (6.2)		
Sweets					
Not taking	15 (11.5)	25 (19.2)	2 (1.5)		
<1 sweet	11 (8.5)	19 (14.6)	3 (2.3)		
1 sweet	18 (138)	24 (18.5)	3 (2.3)	3.391	0.758
>2 sweets	6 (4.6)	4 (3.1)	0		

DISCUSSION

Overall, a high proportion of respondents had low physical activity and inadequate fruits and vegetable consumption. Dietary factors and physical activity patterns strongly influence overweight and obesity among adults. In a study conducted by Tripathy et.al[9] in northern India, overweight was observed in 28.6 % and obesity in 12.8 % of participants and females had more BMI than males. Similarly, in our study overweight was observed in 43.1% and obesity in 15.4% of people and 13.8% females were obese compared to 1.5% males. A study by Sharma D[14] in Jaipur also gave similar results that females were more obese than their male counterparts and consumption of food groups like cereals pulses and leafy vegetables was found to be lower among both male and female subjects.

In our study, people with minimum physical activity were more over weight and obese which was significant. Similar results were seen in study by Sharma D. In a study done in Punjab[9], nearly 32.6 % of respondents reported light levels of physical activity in rural areas of which, females reported significantly higher levels of light physical activity than males. On the other hand, males reported significantly higher proportion of vigorous-intensity physical activity compared to females. In our study, it was observed that the males were more physically active than females and males did more vigorous-intensity physical activity than females. Similar findings are mentioned in a study done by Ruth Sullivan[15]. In studies conducted on adults in North India[16,17] it was noticed that there is a gradual increase in anthropometric and body composition parameters with the advancement of age which was significant and was similar to our study findings. The association of Physical activity with age observed here are consistent with previous research in southern India[18].

In our study, it was also observed that as age increases the level of physical activity also decreases. The consumption of fruits and vegetables were very low in lower socio economic population compared to class V population and the consumption of cooked meat, fish and poultry was very high among people of all categories. This study being conducted in the coastal parts of Karnataka the consumption of fish was very common among almost all the study population and was reported to be consumed daily.

CONCLUSION

This study shows a definite association between socio demographic characteristics with physical activity and dietary pattern. Males were more physically active compared to females. Individuals who consumed more fruits and vegetables had normal BMI compared to those who consumed less.

RECOMMENDATIONS & LIMITATIONS

Healthy lifestyle with balanced diets of lower energy density and increased levels of physical activity should be promoted both at individual and community level.

Limited sample size might have caused discrepancies in the results and over estimation of food consumed and physical activity among the population is also possible.

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Conflict of Interest: None declared.

Ethical Clearance: Obtained from Institutional Ethical Committee

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Assessment of Underweight and Its Determinants among School Going Adolescents in Hyderabad

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ABSTRACT

Background: Malnutrition is a major public health problem affecting adolescents in developing countries including India. Early adolescence is the second critical period of rapid physical growth. A balanced diet during this period is crucial not only for growth and development but also for good dietary habit in later life.

Objectives: To assess the prevalence of underweight among school going children, and to explain the factors associated with it.

Methodology: A cross sectional study was conducted among students of standard VIII – X in 5 schools of field practice area of Deccan College of Medical Sciences, Hyderabad. Schools were selected from list of schools randomly. Sampled schools were visited on a date given by school authority. Total 763 children were included in study. Pre-tested questionnaires were used to collect information. The data was analyzed by using appropriate statistical tests.

Results: In this study prevalence of underweight was 52%, which was more among government school children (62%) than private school children (48%). In this study we found that highest prevalence of underweight was among 13 years of age group (62%). We also found that underweight was more (63%) class IV&V.

Conclusion: It was concluded that adolescents are facing nutritional stress in the form of underweight in both sexes.

Keywords: *Adolescent, Malnutrition, School children, Underweight*

INTRODUCTION

Adolescence refers the phase of development from childhood to adulthood. In terms of age it extended from 10-19 years. 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. Children decide the future of a country and hence a lot of importance is given to childhood nutrition. School age is the vital period during which body's nutritional status is built. Nutritional requirement of adolescent are more because of more requirement of growth spurt and increase in physical activities. Adolescence is also considered as a second chance for growth or catch up growth for those children who had undergone deficits in nutrition in their early life. Achievement of optimum growth during this period is of utmost importance in maintaining good health thereafter. Adolescent constitute 23% of population in India.[1] Urban slum dwellers are exposed to poor environmental conditions (overcrowding, poor quality drinking water and sanitation, no removal of waste). Ignorance and difficult conditions of life in the slums are likely to result in improper food habits, low health care use and hygiene awareness and lack of knowledge of the origin of sickness and proper measures for the cure. Adolescents living under such conditions are at especially high risk for health and nutritional problems. The health and nutritional status of the children is an

index of the national investment in the development of its future manpower. Therefore comprehensive health care of this section will fulfils the health need of 1/5 population. Poor nutrition among adolescents resulting in short stature and low lean body mass is associated with many concurrent and future adverse health outcomes. The main factors for malnutrition are inadequate food intake and poor health status that are influenced by poverty and lack of access to food, feeding practices, and family size. Childhood undernutrition, highly prevalent in South Asia[2], continues to persist throughout adolescence but little attention has been given to undernutrition of adolescents perhaps for the belief that adolescents are a low-risk group. Growth and nutritional status of adolescents are markedly unsatisfactory among Indian populations where, it is estimated that 59% of boys and 37% of girls are stunted,[1] and low body mass index (BMI) is 53%.[3]

School health services provide an ideal platform to detect the health problems early and treat them. BMI is a very useful approximation to what one should weigh depending on height in children and teens. Body mass index is used to assess underweight, overweight, and risk for overweight. Children's body fatness changes over the years as they grow. This is why BMI for children, also referred to as BMI-for-age. World Health Organization (WHO) has recommended BMI-for-age as the best indicator for use in adolescence as it incorporates the required information on age; it has been validated as an indicator of total body fat at the upper percentiles, and it provides continuity with recommended adult indicator.[4] Body mass index (BMI) has been found the most appropriate, non-invasive and cost effective variable for determining nutritional status among adolescents.[4,5] The present study aimed to assess the prevalence of undernutrition among school going children, and to explain the associated factors, so that recommendation can be given for correction of the nutritional deficiency.

MATERIALS AND METHOD

The present cross sectional study was conducted in 5 schools (3 government and 2 private school), of field practice area of Deccan College of Medical Sciences, Hyderabad. The study was conducted among students of standard VIII – X, aged 13 to 16 years between a period of August 2013 to July2014. Previous studies In India, showed that prevalence of underweight in adolescence is from 28% to 53%.[6-8] Considering 40% of prevalence and by using the formula, $n=4pq/L^2$, with allowable error 10%, sample size determined was 600. Present study was approved by ethical committee of Deccan College of Medical Sciences Hyderabad. The list of school with number of students in each school was obtained. Schools were selected from the school list by using simple random sampling technique till the desired number of sample size is met. Before a school was taken for the study, head of the institution was contacted, purpose of the study was explained and consent was obtained. Consent was also taken from parents through school authority. Sampled schools were visited on a date given by school authority. By this procedure 800 children were drawn from 5 different schools. Importance of the study was explained to the children and encouraged them to participate in the study Children having chronic illness, endocrinal problems, physical and mental defects, those who were absent on the day of data collection and those who did not get the consent from the parents were not included in study population. Finally 763 children were included in study. Pilot study was done on 100 school children and questionnaire and data collection technique was refined accordingly. Pre-tested questionnaires were used to collect personal information, socio-economic particulars, life style patterns, and dietary habits. BMI was calculated by formula weight(kg) / height(m^2). The data entered in excel spreadsheets and analyzed by using SPSS (version 17).The results were assembled in tabular and was expressed as percentage. Chi-square test was used for categorical data and P-value of 0.05 or less was considered for statistical significance.

RESULTS

In this study total 763 students participated. Out of 763 children 402 (52.69%) were underweight, 334 (43.37%) were normal and 27(3.54%) were overweight and obese according to their BMI. Hence prevalence of underweight was 52%. Obese and overweight children had been excluded from further analysis to assess the factors associated with underweight children. Hence further analysis was done on 736 students i.e 402 underweight and 334 normal. In this study both boys and girls were almost in same proportion. Majority of children belong to class II (52%) and Class III (34%) socioeconomic status. Nearly 57% of students were from private school and 43% were from government school. Almost 80% of children were non vegetarian.(Table 1).

In this study we found that highest prevalence of underweight was among 13 years of age group (62%), and as the age increased prevalence of underweight decreased and was least in 16 years of age group (39%). Risk of being underweight was 2.59 times among 13 years of age as compare to 16 years of age. As far as effect of sex on underweight was concerned, there was no significant difference between boys and girls. We also found that there was a trend among different socio economic class, as socio economic class deteriorates risk of underweight also increased. Risk of underweight increased by 2.75 times among class III and 3times among class IV and V compare to class I socioeconomic status. We found that prevalence of underweight was more among government school children (62%) than private school children (48%). Risk of underweight was 80% more among government school children compare to private school children. (table 2). We also found that risk of underweight was 1.97 times more among vegetarian compare to non vegetarian and those who took less calories had 2.66 times more risk of being underweight compare to those who took more calories. (table 3).

Table 1: Socio economic profile of study population (n=736)

Variables		Frequency	Percentage
Age	13 YRS	272	37.0
	14 YRS	245	33.2
	15 YRS	173	23.5
	16 YRS	46	6.2
Sex	BOYS	367	49.8
	GIRLS	369	50.2
Socio Economic Class	Class-I	30	4.0
	Class-II	390	52.9
	Class-III	253	34.3
	Class-IV&V	63	8.5
Types of School	Government	318	43.3
	Private	418	56.7
Dietary Pattern	Vegetarians	151	20.5
	Non Vegetarians	533	79.5

Table 2: Association of socio economic factors with nutritional status of children (n=736)

Variables		Underweight (%)	Normal (%)	Odds Ratio (95% CI)	P Value
Age	13 YRS*	170 (62.5)	102 (31.5)	2.59 (1.36 - 4.92)	p=0.0035
	14 YRS	130 (53)	115 (47)	1.75 (0.92 - 3.3)	p=1.07
	15 YRS	84 ((48.5)	89 (51.5)	1.46 (0.75 - 2.84)	p=0.31
	16 YRS	18 (39)	28 (61)	1	
Sex	BOYS	198 (54)	169 (46)	1	p= 0.77
	GIRLS	204 (55.2)	165 (44.8)	1.05 (0.78 - 1.41)	

Cont... **Table 2: Association of socio economic factors with nutritional status of children (n=736)**

Socio Economic Class	Class-I	11 (36.6)	19 (63.4)	1	
	Class-II	196 (50.2)	194 (49.8)	0.85 (0.39 - 1.86)	p=0.68
	Class-III*	155 (61.2)	98 (38.8)	2.73 (1.24 - 1.86)	p=0.01
	Class-IV&V*	40 (63.4)	23 (36.6)	3.00 (1.21 - 7.40)	p=0.02
Types of School	Private	202 (48.3)	216 (51.7)	1	P<0.001
	Government*	200 (62.9)	118 (37.1)	1.81 (1.34-2.44)	

*statistically significant

Table 3: Association of diet with nutritional status of children (n=736)

Variables		**Underweight (%)**	**Normal (%)**	**Odds Ratio (95% CI)**	**P Value**
Dietary Pattern	Non Vegetarians	300 (50.4)	285 (49.6)	1	p=0.0003
	Vegetarians	102 (67.5)	49 (32.5)	1.97 (1.35 - 2.88)	
Recommended Dietary Allowance	>RDA	105 (39.3)	162 (60.7)	1	p<0.001
	<RDA	297 (63.3)	172 (36.7)	2.66 (1.95 - 3.62)	

DISCUSSION

The present study was undertaken to assess the prevalence of underweight and it's determinant factors among school going adolescent. The study revealed that 402 (52.69%) of the study population were underweight. Similar results found in the many studies conducted in different part of country. In a study in West Bengal by Amitava et al (2016)[9] prevalence of underweight was 54%, in a study by Renu Rawat (2014)[10] it was 48%, by Mrigen (2015)[7] it was 53%, by Abanita (2015)[8] it was 53%. The prevalence of underweight was high in the early adolescent age group. Similar result was found in many studies like Naba kumar das (2013)[11], B Das (2008)[12], Mansur D (2015)[13], Anurag Srivastav (2012)[14], Dambhare DG (2010)[15], Nurul Alam(2010)[16], Abanita(2015) [8]. As far as effect of sex on underweight was concerned, there was no significant difference between boys and girls in this study. Studies from different part of India found different results, like in studies done by Ramachandran et al(2004)[17] in kerala, Unnithan(2007)[18] in Kerala, Naba Kumar Das(2013)[11] in West Bengal, Mrigen(2015)[7] in Uttar Pradesh, underweight was more in girls than boys, while Samiran Bisai(2011)[6], Ranu Rawat(2014)[10], B Das(2008)[12], Abanita(2015)[8] found that underweight was high among boys than girls. We also found that there was a trend among different socio economic class, as socio economic class improved underweight also improved from 63% in class IV&V to 36% in Class-1. Similar result of high prevalence of underweight among lower socio economic class was also reported by many studies i.e. Amitava et al(2016)[9], Mrigen(2015)[7], Maj R Mukharji(2008)[19]. Sunil Pal Singh(2014)[20], Nabeela Fazal Babar(2010). [21] We found that prevalence of underweight was more among government school children than private school

children. This finding was in concurrent with the finding of studies done in Mysore, Karnataka by Ashok NC(2014)[22], Soniya Jangasen(2014)[23] in Chennai, and Y Ramchandran in Kerala(2004).[17]

We also found in this study that underweight was more among vegetarian compare to non vegetarian and those who took calories less than RDA. Mrigen in his study also found that mean calories intake was less among underweight children.[7] In a study conducted by Tarek amin in Saudi Arabia, it was found that underweight children are less among those who frequently consumed meat and alternatives.[24] In a study in West Bengal done by Manisha Sarkar et al, there was less frequent consumption of egg, meat etc among underweight.[25] Mysore study also found diet as determinant of underweight.[22]

CONCLUSION

The present study showed that nutritional status of school going adolescents are markedly unsatisfactory especially among young adolescents, government school children, children of lower socioeconomic class and vegetarians. Adolescents can easily access to health and nutrition information through school and they can learn and adopt healthy habits to avoid nutritional problem in later life. Parents need to provide more nutrients and emotional support. There is a need to focus more on exclusive health care of this section to cater the health need of 1/5th population of the country.

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Drug Inventory Management Techniques in a District Health Office, A Case Study

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ABSTRACT

Introduction: If India has to become a Developed Nation by 2020 then Massive investments in Human Capital & Development of Managerial & Technological skills are mandatory. It is necessary that right material at right time at right place in right quantity & of Right Quality should be made available to increase the efficiency of the system.

Objectives: To Demonstrate the Principles and Techniques of Drug Inventory Management to improve the efficiency and to do a SWOT analysis of the system.

Materials and Method: The study was done at District Health Office, Mysore with the data obtained regarding the Drugs procured under the Cholera Control Programme for the years 2011 and 2012 at District Health office, Mysore from the Indent and Inventory Registers maintained at DHO. Management Techniques Used: 1) Forecasting the Drug Requirement By Time Series Analysis (TSA). 2) stimation of the amount of drugs to be ordered by Economic Order Quantity (EOQ).

Results: Percentage Savings from changing order quantities was 9.92%, Average Monthly Consumption was 2444.17. Cost analysis of the drugs showed annual savings ranged from 1966rs to 23095rs.

Keywords*: inventory management, SWOT Analysis, Cost Analysis, Savings.*

INTRODUCTION

If India has to become a Developed Nation by 2020 then Massive investments in Human Capital & Development of Managerial & Technological skills are mandatory. It is said by our former President of India,Dr. A.P.J. Abdul Kalam in his book Vision 2020[1]. Inventories are idle Resources until they can be consumed. After all they have been Purchased or Procured with Capital, i.e monetary resources, which are always at a premium. There are costs associated not only with the price of resource per say, but also with the procurement process (viz. Cost of ordering, Cost of Stationary, Cost of Communication, Cost of Record Keeping & Salaries of Staff) the storage & Preservation process & even the distribution & the disposal process. Good Management is to organisation what health is to the body the smooth functioning of all its parts. It highlights priorities, adopts Services to needs and changing situations, makes the most of limited resources, improves the standard of services and maintains high staff morale. It is necessary that right material at right time at right place in right quantity & of Right Quality should be made available to increase the efficiency of the system. Lack of proper attention to the material management in the district health system in the country has been a major problem in the effective implementation of various health and family welfare programmes. In health sector about 30-40% of all expenditure are related to materials[2].

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OBJECTIVES

- To Demonstrate the Principles and Techniques of Drug Inventory Management to improve the efficiency.

- To do a SWOT analysis of the system.

MATERIALS AND METHOD

- Setting-District Health Office, Mysore
- Data-The Drugs procured under the Cholera Control Programme for the years 2011 and 2012 at District Health office, Mysore.
- Source of data-Indent and Inventory Registers maintained at DHO.
- Management Techniques Used:

1. Forecasting the Drug Requirement By Time Series Analysis (TSA).
2. Estimation of the amount of drugs to be ordered by Economic Order Quantity (EOQ).

RESULTS

Table 1.List of G.E.Drugs

Serial No.	Name of the drug
1.	ORS Packets
2.	INJ. Ringer Lactate (I.V)
3.	INJ. Normal Saline (I.V)
4.	INJ.5% Dextrose (I.V)
5.	INJ. Gentamycin 80mg
6.	CAP.Tetracycline, 400mg
7.	TAB. Doxycycline, 100mg
8.	TAB.Metronidazole,400mg
9.	TAB.Furozolidone

Cost analysis of GE drugs

Inventory Carrying Cost = 11.5% of Average Inventory Value / Year (2)

Acquisition /n Reorder Cost = Rs.59.10 / Reorder (2)

Total Annual Cost of Item : 232768.00

Total Savings = 23092.72

Percentage Savings from changing order quantities = 9.92%

Table 2: DEMAND PROFILE FOR ORS PACKETS FOR THE YEAR 2013

Month	Consumption during 2002	Consumption during 2001	Total	Seasonality Index
1	1050	950	2000	0.82
2	1100	1050	2150	0.88
3	2200	1900	4100	1.68
4	2450	2500	4950	2.03
5	2050	2200	4250	1.74
6	1200	1100	2300	0.94
7	1150	950	2100	0.86
8	1000	800	1800	0.74
9	1000	750	1750	0.71
10	700	800	1500	0.61
11	600	600	1200	0.50
12	530	700	1230	0.50
	15030	14300	29330	
Average Monthly Consumption = 29330 / 12 = 2444.17				

Table 3: TABLE SHOWING FORECAST AND ACTUAL

CONSUMPTION FOR THE YEAR 2012 *

Item No.	Guesstimate	Forecast by TSA	Actual Requirement
1	14000	14700	15030
2	1500	1710	1980
3	4500	4670	4884
4	6000	8240	8632
5	4000	3610	3936
6	20000	27500	30000
7	11000	12500	13104
8	20000	20040	21108
9	18000	19970	20916

* Forecasting was done by utilizing the data of year 2011

Table 4: COST ANALYSIS OF G.E. DRUGS

Item Sl. No.	Annual Usage	Unit Cost	Reorder Currently In use	Quantity calculated EOQ	Total Relevant Cost Rs. Current	TRS EOQ	Annual Savings
1	15030	0.99	289	3942	3090.13	450.65	2639.48
2	1980	17.83	38	510	3096.52	459.00	2637.52
3	4884	11.78	94	1681	3080.29	343.37	2736.92
4	8632	11.34	166	2576	3073.20	396.08	2677.12
5	3936	12.02	76	1414	3096.60	328.99	2740.61
6	30000	3.70	377	2886	3192.65	1228.84	1966.84
7	13104	2.02	252	2581	3102.51	600.28	2505.23
8	21108	0.87	406	4993	3092.93	499.62	2593.31
9	20916	0.87	402	4971	3096.07	497.34	2598.73
					27923.90	4804.17	23095.76

DISCUSSION

Exponential smoothing technique developed by Robert G.Brown**.** Smoothing factor(a) represents the weight given to the error to adjust the old forecast for the previous month/year. a=2/n+1 (n=No. of time units included in calculation of original forecast. First order exponential smoothening if there is no trend or seasonal variation. New forecast=Old (original forecast)+a(Actual consumption-old forecast). If some trend exists, then second order smoothing is used. New Forecast C=Old Forecast A+a (New Forecast B-Old Forecast A)[3].

Ordering cost V/s Holding cost[4]

EOQ is that quantity of an item to be procured or purchased at which the cost of ordering the annual requirements of an item and the cost of holding that item in stock are nearly equal, i,e, when the total of the two cost is lowest. This results in minimum operating cost.

EOQ=S.R. 2Q) (C1/C2, Q=Annual consumption,

C1=Replenishment or Procurement cost per order per item,

C2=Inventory holding cost per item.

S.W.O.T ANALYSIS

STRENGTHS:

- Transportation facility is present.
- Adequate storage facility available.
- Pharmacysts and supporting staff present in sufficient number.
- Decentralization of Drug procuring system present.

WEAKNESS

- Manual Inventory system has delayed both procurement and distribution[5].
- Poor HMIS.
- Some Drugs are purchased in excess due lack of coordination between GMS and Zillapanchayat.
- Delay in indenting process at all levels.
- Due to non availability of certain drugs the indenting institutions are required to collect the drugs 2-3 times a year.

OPPORTUNITIES

- Makapur committee report is useful for drug inventory management.
- Outsourcing the whole process of forecasting, indenting, procuring and distribution.

- Online indenting process.
- There are excellent short term correspondence courses in management offered by IGNOU and NIHFW, New Delhi, for which the top and middle level health managers could be deputed.

THREATS:

- Delay in release of Budget.
- No monitoring and Evaluation in place.
- No scope for Quality control.
- Drugs with spurious Quality are supplied at times.
- The principle of Essential Drugs/ABC/VED is not followed while procuring drugs.

Pharmacy inventory management is a complex but critical process within the healthcare delivery system. Without adequate pharmacy inventory management practices, hospitals run the risk of not being able to provide patients with the most appropriate medication when it is most needed. Additionally, pharmacies' dispensing patterns and drug selection choices may have a direct effect on the affordability of care[6]. After the purchasing and inventory management system were adopted, rate of approved purchasing documents and rate of inspected products in the first five months were 100%. Rate of correct received products was higher than 95%. Rate of destroyed or expired products was less than 0.5%. Rate of reserved products was less than 3 months. Rate of product shortages for all observed five months was less than 1%[7].ABC value analysis is an important tool used worldwide, in identifying items that need greater attention for control and seek major cost reduction by setting interventions on class A items where saving will be more noticeable. Subsequent analysis by VEN is useful to determine the relative expenditure by public health value which reflects public health needs and morbidity patterns[8].

CONCLUSION

- Proper Forecasting is an integral part of proactive planning. It insures against stockouts or excess stock.
- Systematic forecasting is much efficient than guesstimates in demand management.
- We can calculate the safety stock to offset the deficiency at lead time.
- The Inventory carrying cost is much more than the reorder cost. This was due to inefficient systems used for placing order.
- By following Reorders at EOQ level we can save upto 9.9% money.

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: was taken from the institutional ethical committee.

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Diagnosis of Pulmonary Tuberculosis in HIV Patients of Uttar Pradesh Population

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ABSTRACT

In the present study 45 male and 30 females of P.T infected with HIV patients were studied. In the sputum positivity both male and females were same in percentage (66.6%). In the respiratory signs of male have bronchial breathing 33.3%, creptation was 35.5%, ronchi 8.8% and pleural effusion was 22.2%. In females bronchial breathing was 40%, crepetation 33.3% pleural effusion 16.6% and ronchi 10%. In the study of involvement of lung zones of males right upper zone was 13.3%, right middle zone was 33.3%, right lower zone was 15.5%. Left upper zone was 8.8% , left middle zone was 17.7%, left lower zone was 11.%. In the female patients right upper zone was 20%, right middle zone was 30%, right zone was 20%. In the left lung left upper zone was 10%, left middle zone was 13.3%, left lower zone was 6.6%. In the radiological study lesion of lungs in males fibrosis was 20%, cavity 15.5%, exudates 33.3% miliary 8.8%, pleural effusion 22.2%. In the females fibrosis was 23.3%, cavity 16.6%, exudates 33.3%, milary 10%, pleural effusion 16.6% .This study is quite help to physician, radiologist and epidemologist because increased co-prevalence opportunistic infections especially TB and increasing access to antiretroviral therapy. Is great challenge to WHO mission to eradicate TB and control HIV infection.

Keywords – *TB. HIV, UP- Uttarpradesh, Infection.*

INTRODUCTION

It is established fact that, the symptoms of TB are loss of well being, loss of weight, fever 37° to 39° Anorexia, cough, dry or purulent sputum Haemoptysis , Amenorrhea in females. Chest X-ray shows patchy, irregular opacities, centered usually on upper lobe. cavities within. Such lesion are seen, streaks of fibrosis radiating from hilum, calcification solitary round shadows. Sputum may show positive signs of P.T[(1)]. There are report of reinfection which has two possible ways in adult develop (a) endogenous reaction from the focus of childhood (b) Introduction of fresh bacilli from without i.e exogenous(reinfection) HIV infection is greatest single medical risk factor because cell-mediated immunity which is impaired by HIV, is essential for defense against TB[(2)]. Hence attempt was made to study signs and symptoms of PT patients infected with HIV because HIV pandemic presents a massive challenge to global TB control by WHO[(3)].

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MATERIAL AND METHOD

45 males and 30 females patients of PT who were visiting chest and TB hospital of Rajashree medical college Barelly (UP) as OPD patients but due to strong significant features like weight loss, prolonged fever, chronic diarrhea, oro-pharangeal candidiasis etc along with history of promiscuous sexual behavior, previous blood transfusion. All the 75 patients investigated bacteriologically, radiologically and histo-pathologically to confirm pulmonary tuberculosis in HIV patients. The age group of patients were 25-35 years. The patients belonged to middle class socio-economically.

The signs and symptoms of PT was studied in HIV infected patients to ruleout the severity of PT in Immuno compramised young patients of Uttarpradesh. The duration of study was about two years.

OBSERVATION AND RESULTS

Table -1. Study of sputum positivity in PT patients with HIV infected in both sexes (a) In male patients out of 45,30 (66.6%) were positive and 15(33.3%) were negative.(b) In females out of 30 patients 20(66.6%) were positive and 10(33.3%) were negative for sputum possibility analysis.

Table-2. Study of sign in PT male patients with HIV infection out of 45 male patients 15(33,3%) had bronchial breathing, 16(35.5%) patients had creptation, 4(8.8%) had ronchi , 10(22.2%) patients had pleural effusion.

Table-3. Study of signs of female patients of PT with HIV infection- out of 30,5(16.6%) pulmonary effusion, 3.(10%) had Ronchi, 12,(40%) female patients had bronchial breathing 10,(33.3%) patients had creptations.

Table-4. Study of involvement of zones of lungs in PT with HIV infected female patients out of 30, 6 patients (20%) lungs had right upper zone involvement, 9,(30%) had involvement right middle zone 6,(20%) patients had right lower zone 3(10%) had left upper zone 4(13.3%) had left middle zone 2(6.6%) patients had involvement of left lower zone.

Table-5. Study of involvement of various zones of lungs in PT with HIV infected male patients out of 45,6 (13.3%) patients involved right upper zone, 7,(15.5%) had right lower zone and 4, (8.8%) had left upper zone, 8 (17.7%) had left middle zone, 5(11.1%)had involvement of left lower zone

Table -6: Study of radiological lesions in female PT patients with HIV infected out of 30.7,(23.3%) patients had fibrosis, 5(16.6%) had cavity, 10(33.3%) had exudates 3(10%)had military, 5(16.6%) had pleural effusion.

Table- 7: Study of radiological lesions in male patients of PT with HIV infected, out of 45,9(20%)had fibrosis, 7 (15.5%) had cavity, 15(33.3%) had exudates 4(8.8%) had miliary, 10(22.2%)pleural effusion.

Table-1: Study of sputum positivity in PT patients with HIV infection in both sexes

Male patients = 45

Female patients = 30

No of Patients	Sex	Results or outcome	Percentage
30	Male	Positive	66.6 %
15	Male	Negative	33.3%
20	Female	Positive	66.6%
10	Female	Negative	33.3%

Table -2: Study of respiratory signs in PT patients of males with HIV infected

No of patients =45

No of patients	Signs	Percentage
15	Bronchial Breathing	33.3%
16	Creptation	35.5%
4	Ronchi	8.8%
10	Plural Effusion	22.2%

Table-3: Study of respiratory signs in PT patients of females with HIV infected

No of patients =30

No of patients	Signs	Percentage
5	Plural Effusion	16.6%
3	Ronchi	10%
12	Bronchial Breathing	40%
10	Creptation	33.3%

Table-4: Study of involvement of zone of lungs with HIV infected female's patients

No of patients=30

No of patients	Zones of lungs involved	Percentage
6	Right upper zone	20%
9	Right middle zone	30%

***Cont.*. Table-4: Study of involvement of zone of lungs with HIV infected female's patients**

No of patients=30

6	Right lower zone	20%
3	Left upper zone	10%
4	Left middle zone	13.3%
2	Left lower zone	6.6%

Table-5: Study of involvement of zone of lungs with HIV positive patients of males

No of patients=45

No of patients	Zones of lungs involved	Percentage
6	Right upper zone	13.3%
15	Right middle zone	33.3%
7	Right lower zone	15.5%
4	Left upper zone	8.8%
8	Left middle zone	17.7%
5	Left lower zone	11.1%

Table-6: Study of Radiological lesion in females P.T with HIV infection

No of patients =30

No of Patients	Findings	Percentage
7	Fibrosis	23.3%
5	Cavity	16.6%
10	Exudates	33.3%
3	Miliary	10%
5	Pleural effusion	16.6%

Table-7: Study of Radiological lesion in males P.T with HIV infection

No of patients =45

No of Patients	Findings	Percentage
9	Fibrosis	20%
7	Cavity	15.5%
15	Exudates	33.3%
4	Miliary	8.8%
10	Pleural effusion	22.2%

DISCUSSION

In the present study of diagnosis of PT in HIV infected patients the sputum positivity was same in both sexes patients i.e 66.6% (Table-1) this finding was more or less in agreement with previous studies[4]. In the study of signs of PT in male patients infected with HIV 33.3% had bronchial breathing, 35.5% had creptation, 8.8% had ronchi 22.2% had pleural effusion (Table-2). In the case of female patients of PT with HIV in feats had 16.6% pulmonary effusion, 10% had Ranchi, 40% had bronchial breathing, and creptations were 33.3% (Table-3). Moreover in this study of involvement of zones of lungs in PT with HIV infected patients in female right upper zone 20% ,right middle zone 30%, right lower zone 20%. Left upper zone 10%. Left middle zone (13.3%), left lower zone (6.6%) (Table-4) Involvement of zones of lung in males patients of PT with infected HIV, had right upper zone 13.3%, right middle zone 33.3% , right lower zone was 15.5%, left upper zone was 8.8%, left middle zone was 17.7%, left lower zone 11.1%. It is but natural that bronchus is straight and short towards right lung hence right middle zone of lung is highly involved in both sexes, 33.3% in males and 30% female patients respectively and least was left lower zone in both sexes 6.6%, in females, 11.1% in males because left bronchus was long and obliquely placed hence left lower zone was last to get infected. In the study of radiological lesion in females. The fibrosis was 23.3%, cavity 16.6%, exudates 33.3%, miliary 10% ,pleural effusion 6.6%, (Tabl-6) In males radiological lesions were fibrosis 20%, cavity 15.5%, exudates 33.3%,miliary 8.8.% plural effusion 22.2%.(Table-7). These finding are more or less in agreement with previous studies [5] [6] [7] but in studies of both sexes significant differences were not observed. Fibrosis shows re or secondary infection, cavity, excudates shows severe infection miliary shows involvement of blood and blood vessels. It was often considered that in mild immune-suppression the lesion of lungs were a typical and should be taken serious note because of high mortality rate [8] [9] [10] because HIV reduces both inflammatory reactions and cavitations of pulmonary lesion as a result patient chest X-ray can show non-specific pneumonia or even be normal also. Even though Acid-fast bacilli are present in sufficient numbers to appear in sputum smear: PT. may develop early in AIDS and may be presenting its manifestation. Haematogenous dissemination of TB people with HIV infection produces serious, often baffling illness with

symptoms of both infections. A myco-bacterial illness in AIDS patients that develops while in $CD4^+$ T cell count> 200/µl is almost always TB. By contrast depending on probability of TB exposure a myco-bacterial infection that develops while $CD4^+$ count in<50/µl is usually due to M.avium complex which is not contagious. TB in HIV patients generally respond well to usual regimens when in vitro study shows sensitivity for multi drug resistance strains . However, outcomes are not favorable because drugs are more toxic and less effective [11].

SUMMARY AND CONCLUSION

The present study of diagnosis of PT in HIV infected patients helps for physicians, Radiologist and epidemiologist to treat such patients of both sexes meticulously because morbidity and mortality rate is very high. This study demands further awareness among the people regarding communicable disease. TB is quite common mal-nutritious and under-nutritious people hence awareness regarding proper nutrition supplement also require to pursue in rural and among illiterate people and educate people to use safer measures to prevent HIV Otherwise the mission of WHO DOTS programs and focused effort to control HIV related TB remains in-complete.

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The Effectiveness of Behavior based Safety Interventions (BBS) as an Efforts to Reduce Unsafe Action of Nurse in the Inpatient Uniti of RSUD Dr. Saiful Anwar Malang

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ABSTRACT

The study was conducted to study the effectiveness of Behavior Based Safety (BBS) interventions in an effort to reduce unsafe action (how to lift patients from wheelchair to bed) with a nurse in the inpatient unit 1 Hospital Dr. Saiful Anwar (RSSA) Malang ".This study was a pre-experimental design with treatment design approach of one group pre-test and post-test design with a number of research subjects were 42 people in the inpatient unit 1, analyzed by using McNemar Tets. The method used was by means of a questionnaire, observation, interview and intervention. Intervention is given in the form of video playback associated with lifting a patient from a wheelchair to a bed. Variables used in this research was unsafe acts (unsafe action) collected through methods *Critical Behavior Checklist* (CBC) and the level of knowledge and characteristics of the study subjects were collected through questionnaires. McNemar test results on the level of knowledge gained value with p-value of 0.007. That is, there is a difference between knowledge before and after the intervention. Whereas the McNemar test results against unsafe acts (unsafe action) obtained p-value of 0.359. This means that there is no difference before and after intervention. Therefore, it can be concluded that the intervention of *Behavior Based Safety* (BBS) given to nurses in the inpatient unit 1 RSUD Dr. Saiful Anwar effective only on the level of knowledge with a 77.6% rate of effectiveness.

Keywords: *Effectiveness, Behavior Based Safety (BBS) Interventions, Unsafe Action, McNemar Test.*

INTRODUCTION

Hospital is a health care institution that organizes personal health services in plenary that provides inpatient, outpatient, and emergency, Hospital is one of the organization of health care providers which are required constantly improving the safety and health care to build a safer thus gaining customer loyalty. Safety in the hospital is an important aspect and basic principles of the health services as a critical component of quality management and one of the indicators in the assessment of hospital accreditation.

Service orientation in the hospital at this time is the safety of the patient, but the hospital staff safety is also important. Patient safety, safety officers and safety systems relate to each other. The hospital is one of the dangerous places for nurses, for nurses can be infected by a variety of risk of injury and illness at work. This is because nurses are health care workers who come into contact with the patient's in long period.

Work accident is an event that does not backfire and unpredictable, in terms of causing losses of time, treasure and soul of labor in the process industry or related work , Workplace accidents are generally caused by two things unsafe work behavior (unsafe action) and unsafe working conditions (unsafe conditions). This is supported by the Dupont Company research showing that 96% of workplace accidents are caused by unsafe behavior and 4% were caused by uusafe condition.

Results report by the National Safety Council (NSC) shows that accidents in RS 41% larger than other industry workers. Common causes are pricked, sprains, lumbago, scratches/ cuts, burns, and infections. There was also obtained from the results of research in health facilities hospitals, approximately 1,505 women workers at the Hospital of Paris impaired musculoskeletal (16%) where 47% of the disruption of pain and lumbar spine area. Musculoskeletal nurse interference is related to the manner or unsafe working position when treating

patients for example, such as lifting the wrong way.

Services are installed inpatient health care complex that 60% of workers are nurses. Nurses are professionals in the health sector who have a high risk of the occurrence of occupational diseases and accidents. Nurses are health care workers who are always in direct contact with patients; nurses are at risk of contracting various infectious diseases. Results of data polyclinic Hospital Preparednessaverage 10 nurses per year come to the clinic with complaints of experiencing LBP or other musculoskeletal injuries due to push, lift or move pasein.

Results of preliminary observations and interviews on several nurses at Regional General Hospital (RSUD) Dr. Saiful Anwar (RSSA) Malang in the inpatient unit, there are nurses who experience back pain at the time of providing care to the patient (how to lift patients from wheelchair to bed), because of factors work that still manual handling is lifting patients with severe patients vary so require over-exertion to lift the patient.

Accordingly, this study focuses on the inpatient unit 1 associated with lifting a patient from a wheelchair to a bed done by nurses based on the operational standards presedur (SOP). In the inpatient unit 1 has a high workload and the quantity of the number of patients and more each day with the mobility of nurses activity very much. Conditions like these that can cause any disturbance muskoleskeletal nurse. Unsafe work behavior, if constantly performed by nurses would risk serious industrial accidents. The results of the data analysis work accidents that have occurred at the hospital, basically factors affecting the accident one of them is a behavioral factor.

Based on the reference that unsafe behavior is the biggest contributor to accidents, to reduce occupational accidents and to improve safety performance can only be achieved with the efforts of Behavior Based Safety (BBS) in the workplace, which is expected to be created a safety culture in the workplace, Behavior Based Safety (BBS) is an application of the method invented by Herbert William Heinrich. Behavior Based Safety (BBS) is an approach to preventing workplace accidents through behavioral change approach. Behavior Based Safety (BBS) is a scientific way to understand the behavior of someone who is related to safety. Application of Behavior Based Safety (BBS) is an effort to intervene in unsafe behavior into safe behavior in its aim to achieve zero injuries.

Application of Behavior Based Safety (BBS) using DO IT (Define, Observation, Intrevensi and Test) on the hospital is expected to increase the knowledge and safe behavior on nurse khsusnya nurses who were in the inpatient unit 1 associated with unsafe action (unsafe behavior). Accordingly, this study was conducted to study the effectiveness of interventions Behavior Based Safety (BBS) in an effort to reduce unsafe action on nurses in the inpatient unit I Hospital Dr. Saiful Anwar Malang (RSSA) ".

MATERIAL AND METHOD

This study uses a pre-experimental design. Researchers gave the intervention to 42 nurses in the inpatient unit 1 RSUD Dr. Saiful Anwar Malang to determine the effectiveness of the level of knowledge and unsafe behavior (unsafe action). Interventions were given to the subject of research in the form of video playback Capture way patients from wheelchair to bed. Measurements before the intervention (pre-test) conducted research on the subject to determine the initial value of the variable course of a study. Then the intervention was given to the subject of the research group. After the intervention, the variable value measurements conducted research on the subject again (post-test). To measure variables unsafe acts (unsafe action) before and after the intervention is done by using the format of Critical Behavior Checklist (CBC) and to measure the knowledge variables used a questionnaire based on the operational standards procedure (SOP). The design of study is described in Figure 1.

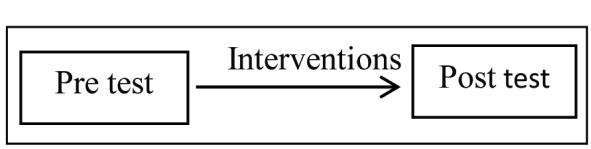

Figure 1. Research Design

Data were analyzed by using McNemar Tets. Whereas, the level of effectiveness of interventions of Behavior Based Safety (BBS) was calculated by using the following formula of effectiveness:

$$\text{Effectiveness} = \frac{\text{skor post test - skor pre test}}{\text{skor pre test}}$$

FINDINGS

Characteristics of the study respondents consisted of 42 nurses of inpatient unit 1 RSUD Saiful Anwar Malang based on a questionnaire as follows.

Table 1. Characteristics of Research Subjects

No.	variables	Category	Percentage
1.	Gender	Man	31%
		woman	69%
2.	Age	20-30 years	78.6%
		31-40 years	9.5%
		<41 years	11.9%
3.	Years of service	<6 years	59.5%
		6-10 years	26.2%
		> 10 years	14.3%
4.	last education	D3	76.2%
		S1	19.0%
		nurses	4.8%

The data collection characteristics of the subject of research conducted by questionnaire interviews include age, gender, education and past work period, below is an explanation of each study subject characteristics:

Gender

The majority of nurses in inpatient unit I RSUD Dr. Saiful Anwar were female. Respondents were 29 female nurses with a percentage of 69%, while the male nurse were 13 nurses with a percentage of 31%. Results of psychological research shows that female workers are more willing to conform to the rules in the workplace.[1]Due to the aggressive nature of which is owned by male workers tend to be against the existing authorities, so it will be less careful in their work and will ultimately lead to an accident. This can be a problem for men who work as nurses.

Age

Based on the characteristics of age known that most of the research subjects in inpatient unit 1 RSUD Dr. Saiful Anwar was at the age of 20-30 years by 78.6% and most of them were in the range of age <41 years as many as five nurses 11.9%. So it can be said that the majority of nurses were at a younger age than older nurses. It can be used as capital for the nurse to give the treatment to the patient (lifting or transferring patients from wheelchair to bed) because the nurse with a relatively young age would be stronger to move or lift a patient from a wheelchair to a bed. The reason is found based on the results of interviews with study subjects.

Years of service

The highest percentage of nurses based on length of tenure is nurses with less than 6 years of were 59.5%. Nurses with terms of 6-10 years were 26.2% and only 6 respondents (14.3%) who have work experience of more than 10 years. Experience for someone to recognize hazards in the workplace is getting better with age and years of service, so that the old workers will be more familiar points of danger at their workplace, which in turn can minimize the occurrence of errors (error) which may lead to an accident.

Last education

Most (about 80%) of nurses in Indonesia have three nursing education diploma.[2] Respondents' education level that most of the Nursing Diploma (D3) of respondents 32 with the percentage of 76.2% and only 2 respondents who holds final training as nurses. The level of education is a predisposing factor one behaves. Education is a fundamental factor for motivating the behavior of or provide personal references in one's learning experience.[3] Therefore, a person's level of education will determine the extent of the person's knowledge and how to act and behave. Research subjects were a Diploma of Nursing (D3) having practical experience of field work more than nurses with S1 degree who will surely add to the learning experience of a person.

Table 2. Effectiveness of Interventions Behavior Based Safety (BBS) Towards Knowledge Before and After Intervention.

Prior knowledge Intervention	Knowledge After Intervention		Total
	Enough	Good	
Enough	5 (11.9%)	17 (40.5%)	22 (52.4%)
Good	4 (9.5%)	16 (38.1%)	20 (47.6%)
Total	**9 (21.4%)**	**33 (78.6%)**	**42 (100%)**
McNemar	0.007		

Based on test McNemar test is known that p-value <0.05, it can be concluded that there is a difference between before and after intrevensi associated with the level of knowledge. The results are consistent with results of previous studies conducted by Yuni entitled "Effectiveness of Interventions Behavior Based Safety (BBS) in an effort to reduce unsafe behavior of nurses in the emergency department of Hospital Dr. Isaac Tulungagung ". The results of this study look at the effectiveness of interventions BBS on the level of knowledge according to the characteristics of respondents are known to carry a significantly increased knowledge.[4]

Based on the results of the above table it can be seen that the respondents who have sufficient knowledge before the intervention were 22 respondents (52.37%), increased knowledge after the intervention as much as 33 respondents (78.47%). Subject of the study prior to the intervention with a good knowledge were 4 respondents (9.5%) in the category of sufficient knowledge after the intervention. The subject of research which has decreased the level of knowledge after the intervention due to the condition of the respondents at the time of data collection post the knowledge that respondents experience fatigue because the data collection was carried out on the night shift than that the study was conducted in the month of fasting so it will aggravate the condition respondent.

To determine the effectiveness of interventions big Behavior Based Safety (BBS) can be calculated with the following formula effectiveness.

$$\text{The effectiveness knowledge} = \frac{78,6 - 47,6}{47,6} = 77,6\%$$

The level of effectiveness of interventions Behavior Based Safety (BBS) on the level of knowledge in the inpatient unit 1 Hospital Dr. Saiful Anwar poor is 77.6%. This means that the intervention of Behavior Based Safety (BBS) which is given by way of video playback on how to lift patients from wheelchair to bed effectively.

Table 3. Effectiveness of Interventions Behavior Based Safety (BBS) Action Against Unsafe (unsafe action) before and after intervention.

unsafe Action before Intervention	**unsafe Action after Intervention**		**Total**
	safe action	**Measures Unsafe**	
safe action	8 (19%)	7 (16.7%)	15 (35.7%)
Measures Unsafe	12 (28.6%)	15 (35.7%)	27 (64.3%)
Total	20 (47.6%)	22 (52.4%)	42 (100%)
McNemar	**0.359**		

Based on test McNemar test obtained p-value <0.05, therefore, it can be concluded that there is no difference between before and after intrevensi associated with unsafe acts (unsafe action). Although there is no difference, but the results of the frequency of unsafe acts (unsafe action) to the nurse in the inpatient unit 1 high majority. To change people's behavior in terms of attitude and motivation towards safer work is not an easy task and does not happen overnight.[5] So naturally if intervention Behavior Based Safety (BBS) conducted still does not work because there are many factors that affect a person's behavior

Based on the results of the above table reveals that a decline in unsafe acts (unsafe action) when lifting a patient from a wheelchair to a bed although not significantly. Before the intervention, the respondents who carry out unsafe act (unsafe action) were 27 respondents (64.3%). After the observation conducted there were 22 respondents (52.4%) were still perform unsafe acts, this means that only 5 respondents who reduced the unsafe action after intervention was given to the them. Subject of the study prior to intervention with a safe action were 7 respondents (16.7%) to the category of unsafe actions after the intervention. This happen due to the time of observation (observation after the intervention), making the data was taken on the night shift (23:00 to 00:00) where the condition of the research subjects have been very exhausted so that the data of post-test for unsafe acts (unsafe action) does not match the expected result.

To determine the effectiveness of interventions of Behavior Based Safety (BBS) can be calculated with the following formula of effectiveness.

$$\text{The effectiveness of BBS interventions} = \frac{\text{skor post test - skor pre test}}{\text{skor pre test}}$$

$$= \frac{52,4 - 64,3}{64,3}$$

$$= 51,4\%$$

Thus, the level of effectiveness of interventions Behavior Based Safety (BBS) related to unsafe acts (unsafe action) saaat lift patients from wheelchair to bed in the inpatient unit 1 Hospital Dr. Saiful Anwar poor

is 51.4%. It can be concluded that the intervention of Behavior Based Safety (BBS) which do not effectively.

CONCLUSION

The intervention of Behavior Based Safety (BBS) through video playback given to nurses in the inpatient unit 1 of RSUD Dr. Saiful Anwar Malang (RSSA) can effectively improve the knowledge of nurses with the level of effectiveness of 77.6%.

The results of the identification of unsafe acts (unsafe action) before and after the intervention of behavior-based safety (BBS) note that although not all research subject change behavior but there are a few research subjects with unsafe acts (unsafe action) has been reduced after the intervention. The intervention of Behavior Based Safety (BBS) to reduce unsafe act through video playback given to nurses in the inpatient unit 1 RSUD Dr. Saiful Anwar Malang (RSSA) does not work with the level of effectiveness of 51.4%.

Conflict of Interest: None

Source of Funding : None

Ethical Clearance: The study was approved by the ethical committee of Hospital Dr. Saiful Anwar Malang. All subjects were fully informed about the procedures and objectives of this study and each subject prior to the study signed an informed consent form.

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Physical Activity and Depression among Adolescents in West Godavari District, Andhra Pradesh

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ABSTRACT

BACKGROUND: An estimated 20% of world's adolescents have mental health or behavioral problem. Understanding the relationship between physical activity and depressive characteristics among the adolescent population is important in addressing two major public health concerns: depression and lack of physical activity. The present study was conducted with the aim to estimate the level of Physical activity and depression and to find out the association between them. MATERIALS AND METHOD: A School based Cross-sectional study was conducted among students of 6th to 10th standard of 1 government and 2 private schools in Eluru city, AP. A total of 450 students were studied based on sample size, calculated by taking adequate physical activity prevalence 40% with 95% CI and relative precision of 12%. Physical activity was measured using PAQ-A (Physical Activity Questionnaire for adolescents) and depression was measured using Becks Depression Inventory II (BDI II) questionnaire by interview method. RESULTS: Out of 450 subjects 248(55.1%) were males and 202(44.9%) were females. The prevalence of depression was 42.2% and inadequate physical activity was found among 43.1% subjects. Correlation between physical activity and depression was r= -0.252. CONCLUSION: School health authorities must take initiative to increase the physical activity sessions in all the schools with immediate effect.

Keywords: *Adolescent, Becks Depression Inventory II, Depression, Physical activity, Physical Activity Questionnaire for adolescents.*

INTRODUCTION

In India nearly 20% of the population are adolescents[1]. Adolescence is a crucial developmental stage marked by a confluence of physical, biological, psychological and social challenges. Most are healthy, but there are still significant deaths, illness and diseases among adolescents. Illnesses can hinder their ability to grow and develop to their full potential. An estimated 1.3 million adolescents died in 2012, mostly from preventable or treatable causes[2].

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Depression is the leading cause of ill health and disability worldwide. More than 300 million people are now living with depression, an increase of more than 18% between 2005 and 2015[3]. Half of all mental health disorders in adulthood appear to start by age 14, but most cases are undetected and untreated, since they rarely seek psychiatric help[4]. Depression is the third leading cause of illness and disability among adolescents, and suicide is the third leading cause of death in older adolescents (15–19 years). An estimated 20% of the world's adolescents have a mental health or behavioral problem[4].

Adolescence which is the transitional period from childhood to adulthood is a stage of emotional instability making them vulnerable to depression[5]. Studies have found that 3-9% of teenagers meet criteria for depression at any one time, and at the end of adolescence, as many as 20% of teenagers report a lifetime prevalence

of depression[6]. Adolescence is a critical period and depression during this time may impact on educational attainment, and is also associated with an increased likelihood of recurrence of symptoms later in life. Potentially modifiable risk factors, such as physical activity (PA), are therefore of great interest[7].

The World Health Organization recommends that children and young people aged 5 to 17 years old should accumulate at least 60 minutes of moderate to vigorous-intensity physical activity per day[3]. Physical activity has been shown to have substantial benefits among adults experiencing symptoms of depression, but there is less evidence for its effects amongst children and adolescents[8, 9]. Among children, most of the evidence on PA and mental health is based on cross-sectional studies[11-17]. Most support an association between more frequent PA and lower levels of depression amongst adolescents[11-15], although there are exceptions[16, 17].

There are few psychosocial explanations for the link between physical activity and depression. The 'mastery' hypothesis, suggests that it is the completion of a task that brings about a sense of achievement, leading to improved mood[18, 19].

OBJECTIVES

1. To estimate the level of Physical activity and depression.

2. To find out the association between physical activity and depression among adolescent school children.

MATERIALS AND METHOD

A school based cross-sectional study was done in students of 6th to 10th class of 1 government and 2 private schools in Eluru city, Andhra Pradesh from Jun 2016 – Sep 2016. Sample size was calculated taking adequate physical activity prevalence of 40% with 95% Confidence Interval and relative precision of 12% from a previous study[20]. The final sample size was rounded to 450 subjects. 150 students were studied from each school and 30 students from each class were selected by simple random method proportionate to sample size.

Ethical committee permission was obtained from Institutional ethical committee. The purpose of conducting the study was explained to the head of the school and permission was taken prior. Information about the study was given to the teachers, parents and students a week before the commencement of the study. Parents could choose to opt their child out. Students who had not been opted out were invited to take part and asked for written assent and consent.

Students were asked to fill pre-tested, semi-structured questionnaire, which contains information regarding socio-demographic factors and were then interviewed personally using Becks Depression Inventory II (BDI II) scale for measuring level of depression and PAQ-A (Physical Activity Questionnaire for adolescents) for measuring level of physical activity.

BDI II scale is a 21 item questionnaire. Each of the 21 items corresponding to a symptom of depression is summed to give a single score for BDI-II[21] & was standardized by doing a pilot study on 50 students and was validated using Cronbach's alpha index test and the internal consistency was 0.89. It has four-point scale for each item ranging from 0 to 3. Total score of 14-19 was mild, 20-28 was moderate, and 29-63 was severe depression and above was considered as students having depression.

PAQ-A is 10 item questionnaire of which each has a value from 1 to 5 for each of the 9 items (items 1 to 9) used in the PA composite score, the mean of these 8 items, which results in the final PAQ-A activity summary score[22]. The total mean score range between 0 to 5 and mean score less than 2.5 was considered inadequate physical activity for the present study. Item 10 was used to identify the cause which is preventing them from being physically active, but this question was not used as a part of the summary activity score.

Data was entered and analyzed using Epi Info 7 and p-value less than 0.05 was considered statistically significant.

RESULTS

Out of 450 subjects 248(55.1%) were male and 202(44.9%) were female. The prevalence of depression was 42.2% (Mild- 25.6%, Moderate – 12.8%, Severe – 3.8%) and inadequate physical activity was found among 43.1% subjects.

The prevalence of inadequate physical activity was high among females (44.6%) when compared to males (41.9%) and the level of depression was 43.1%, 41.5% in females and male respectively. There was

no significance association found between gender and depression, physical activity (p>0.05).

Among the age group of 10-12 years, 12-14 years and 14-16 years 32.2%, 46.5% and 48.2% had depression respectively as shown in table. The association between age and depression was found to be statistically significant (p<0.05). Among type of school, private school students 46% had followed by government school students 34.7%. The association between type of school and depression was found to be statistically significant (p <0.05).

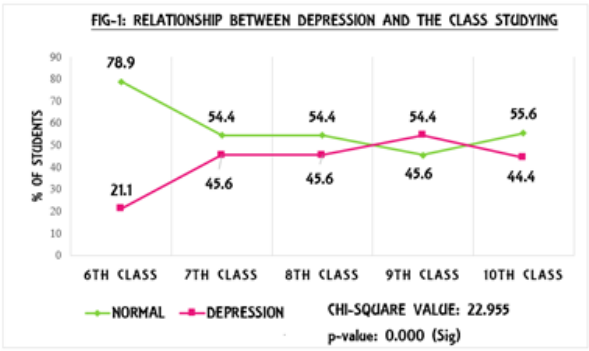
In age group of 10-12 years, 12-14 years and 14-16 years 43.6%, 36.4% and 53.5% were not physically active respectively as shown in table. The association between age and physical activity found to be statistically significant (p<0.05). Among type of school, private school students 49.7% followed by government school students 30% were physically inactive. The association between type of school and level of physical activity was found to be statistically significant (p <0.05).

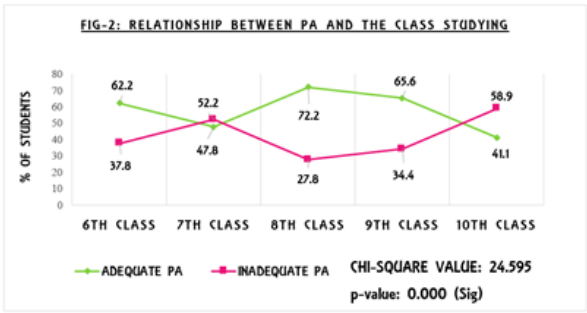
The prevalence of depression in 6th, 7th, 8th, 9th and 10th standard in the present study was 21.1%, 45.6%, 45.6%, 54.4% and 44.4% respectively as shown in fig-1. There was a statistical significant association found between depression and standard of students (p<0.05). As the class increases the level of physical activity decreases. 58.9%, 34.4%, 30%, 54.4% and 37.8% in 10th, 9th, 8th, 7th and 6th standard were physically inactive as shown in fig-2. There was a statistical significant association found between standard of students and level of physical activity (p<0.05).

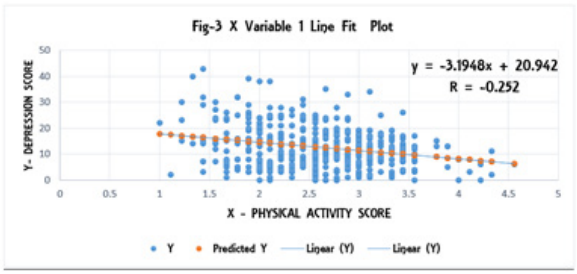
There was an inverse relationship found between level of physical activity and level of depression. As the physical activity mean scores increases the depression score decreases. The Pearson correlation between physical activity and depression was –0.252 as shown in fig-3.

Table showing relationship between socio-demographic factors and PA, depression

S.No			PHYSICAL ACTIVITY		DEPRESSION	
			ADEQUATE (%)	INADEQUATE (%)	NORMAL (%)	DEPRESSION (%)
1.	AGE	10 - 12 YRS	84 (56.4)	65 (43.6)	101 (67.8)	48 (32.2)
		12 – 14 YRS	119 (63.6)	68 (36.4)	100 (53.5)	87 (46.5)
		14 – 16 YRS	53 (46.5)	61 (53.5)	59 (51.8)	55 (48.2)
			χ^2 value = 8.513, d.f=2, p-value = 0.014		χ^2 value = 9.231, d.f=2, p-value = 0.010	
2.	GENDER	MALE	144 (58.1)	104 (41.9)	145 (58.5)	103 (41.5)
		FEMALE	112 (55.4)	90 (44.6)	115 (56.9)	87 (43.1)
			χ^2 value = 0.311, d.f=1, p-value = 0.577		χ^2 value = 0.108, d.f=1, p-value = 0.743	
3.	TYPE OF SCHOOL	GOVERNMENT	105 (70)	45 (30)	98 (65.3)	52 (34.7)
		PRIVATE	151 (50.3)	149 (49.7)	162 (54)	138 (46)
			χ^2 value = 15.770, d.f=1, p-value = 0.000		χ^2 value = 5.265, d.f=1, p-value = 0.022	







DISCUSSION

The prevalence of depression in the present study was found among 42.2% students. The prevalence of depression in various studies using similar depression rating scale is ranging from 18.4%-79.2%[23-26]. The wide range of prevalence is due to variation in diverse socio-economic characteristics, settings of survey and timings of study.

In the present study, with increase in age there is increase in prevalence of depression. The highest prevalence 48.2% was found among 14-16 years age group and there was significant association found between age and depression. Study done by Nagendra et al[26], Rani Mohanraj et al[24], Joseph et al[25] on adolescent have also reported a similar relationship between age and depression. However studies conducted out by Bahls et al[28], Ahmad et al[27] didn't have a significant relationship between age and depression but both the studies reported that as age increases level of depression also increases. 14-16 years (53.5%) were more physically inactive when compared to other age groups. There was a significant association found between age and level of PA.

Out of total 450 students 248(55.1%) were males and 202(44.9%) were females. Depression among the female students was more (43.1%) as compared to that of male students (41.5%). In the present study there was no significant association found between gender and depression, which is similar to the studies carried out by Chauhan et al[29]. Studies carried out by Rani Mohanraj et al[24], Bahls et al[28] also reported that females were more depressed than males but had a significant relationship between gender and depression. Females 44.6% were more physically inactive when compared to males 41.9%. There was no association found between gender and the level of PA.

Students studying in private had high prevalence 46% of depression when compared to students studying in government school 34.7%. This probably may be due to high amount of academic stress up on students studying in private schools. A high significant association was found between type of school and depression. This is in contrast to the study carried out by Joseph et al[25] may be due to, the inclusion of pre-university students in the study.

There was a sudden increase in prevalence of depression i.e., from 21.1% to 45% in 6th to 7th class and almost constant in the following standards, this may be due to pubertal changes. Most physically inactive children was found among students of 7th and 10th standard ie. 52.2% and 58.9% respectively. This probably due to high amount stress upon these students due to board exams which was in the state and not allowing to play by parents and teachers.

An inverse relationship was found between depression and PA. As the physical activity score increases the depression score decreases and the Pearson correlation between them was r= -0.252. Correlation coefficient between physical activity (x-axis) and depression (y-axis) Y= -3.1948X + 20.942. The relation between PA and depression among adolescents was similar to many studies[10-15], although there are exceptions[16, 17]. In many, the association between PA and

depressive symptoms is modest (r = -0.14 to -0.18)[12-15]. The present study suggests that amount of PA undertaken is inversely associated with depressive symptoms in adolescents.

Recommendations: School health authorities must initiate to increase the physical activity sessions in all schools with immediate effect.

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Home Care Intervention to Improve Nutritional Status of Severe Acute Malnourished (SAM) Children in Yogyakarta, Indonesia

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ABSTRACT

This study aims to evaluate effects of home care to improve nutritional status of acute malnourished children. Quasi-experimental with pretest-posttest control group design was carried out. The study was used 22 health centers in Yogyakarta. Samples were selected in intensive, strengthening and independent phases. Data collected included anthropometric measurement, and socio-demographic characteristics. Data were analyzed using chi square, t-test and linier mixed effect model. After three months, significant escalations were found in the anthropometric indicator among experimental groups. Then, the proportion of wasting in the experimental group was reduced to 56.7% (P=0.0001), whereas proportion of wasting in the control group showed no reduction (P=0.317). Three month of home care program was be able to improve the nutritional status of children.

Keywords : *Children, home care, malnutrition, nutritional status, yogyakarta*

INTRODUCTION

Malnutrition contributed to approximately 40% of 11 million deaths of children in developing countries anda quarter of children in developing countries have malnutrition[1]. Malnutrition is still an issue in Indonesia, including in the Special Region of Yogyakarta. Yogyakarta district has the highest number of severe acute malnutrition in this region.

Community Therapeutic Care is an approach which can be applied to manage acute malnutrition in children in the communities. The CTC approach has three models of care and treatment: Supplementary Feeding Program (SFP), Outpatient Therapeutic Program (OTP), and Stabilization Centers (SC) [2-3].

Community Therapeutic Care combines three approaches in handling malnourished children[3]. Two approaches, intervention program in the community and stabilization centers have been implemented in Indonesia but not home care. Recent studies report that home care is effective for malnourished children by improving their nutritions at home[4-5]. The objective in this study is to improve nutritional status of malnourished children by using home care program in Yogyakarta.

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METHOD

A quasy-experimental study with pretest-posttest control group design was carried out for the study. The study was carried out in two districts of Yogyakarta Province (Yogyakarta city and Sleman district). The study was implemented in three phases of home care from January 2012 to April 2012 with one months between the phases.

The sample selected was 56 children with severe and moderate acute malnutrition for both study sites, 33 children in Yogyakarta and 23 children in Sleman. Purposive sampling was used to identify the children to be included in both study area. Three stages

of intervention consisted of intensive mentoring, reinforcement mentoring and independent stage with one month intervention in every stage. The nutritional status was measured during baseline, one month, two month and three month after intervention.

Nutritional status was calculated by using the WHO growth reference standards for weight-for-height z-score (WHZ). Data were analyzed using descriptive and inferencial statistics. Pearson's Chi-square and Fisher Exact tests were used to establish the association between two categorical variables, t-test to compare the z score, Mann-Whitney test to compare nutritional status and Linier mixed effect model to know the factor that influence to malnourished most. The significance level was set at alpha was 0.05, and a 95% Confidence Interval. The protocol used was approved by the Committee of Ethics in Research of the Faculty of Medicine Gadjah Mada University. Adequate information regarding importance of this interventional study was given to parents and informed consent was signed with its, authorization was given including each child in the study.

RESULTS

Children participated at the endline were 56 consisted of 25 – control and 35 - intervention. Some children were dropped out from this study due to relocation of their residence. There was no significant difference (P > 0.05) in the children's age, weight and height (Table 1).

Table 1. The distribution of anthropometric measure of the children (N=56)

Variable	Experimental (n=33) Mean±SD	Control (n=23) Mean±SD	Mean Diff (95% CI)	p
Age (month)	33.24±12.41	30.61±16.23	2.64 (-5.04; 10.31)	0.49
Weight (kg)	8.97±1.60	8.27±1.89	0.69 (-0.25; 1.64)	0.14
Height (cm)	84.68±8.77	81.13±10.37	0.17 (-1.60; 8.69)	0.17
Z score WHZ	-3.13±-0.34	-3.24±0.23	0.11 (-0.06; 0.27)	0.44

WHZ – Wieght for Height; SD – Standard Deviation; p value of t-test of differences between the groups

Table 2. The socio-demographic characteristic of the children (N=56)

Characteristic and Category	Experimental (n=33)		Control (n=23)		p-value
	n	%	n	%	
Amount of children in family					
1	22	66.7	12	52.2	0.10
> 1	11	33.3	11	47.8	
Gender					
Male	20	60.6	13	56.5	0.76
Female	13	39.4	10	43.5	
History of exclusive breastfeeding					
Exclusive	14	42.4	8	34.8	0.14
Not exclusive	19	57.6	15	65.2	
Age of mothers					
< 35 years	20	60.6	15	65.2	0.06
≥ 35 years	13	39.4	8	34.8	
Parent occupation					
Government employee	1	3.0	0	0	0.0001*
Labor	32	97	23	100	
Monthly family income					
≥ Regional Minimum Wage	17	51.5	6	26.1	0.02
< Regional Minimum Wage	16	48.5	17	73.9	
Education of mother					
High	24	72.7	12	65.2	0.03
Low	9	27.3	11	34.8	
Education of father					
High	25	75.8	15	65.2	0.001
Low	8	24.2	8	34.8	
Caregiver					
Mother	26	78.8	20	87.0	0.0001*
Not mother	7	21.2	3	13.0	

P value of X^2 of differences between the groups

The characteristic of socio-demographic showed there was no significant difference (P > 0.05) in the number of children in family, children's sex, exclusive breastfeeding, and mother age among the control group and experiment groups. There was significant difference (P < 0.05) in parent's occupation, monthly family income, education of mother, education of father and caregiver of children (Table 2).

Table 3. Nutritional status of wasted children by studied groups during the different phases

Nutritional Status	Baseline n (%)		After 1 months n (%)		After 2 months n (%)		After 3 months n (%)	
	IG	CG	IG	CG	IG	CG	IG	CG
Severe wasting	25 (75.8)	16 (69.6)	14 (42.4)	18 (78.3)	15 (45.5)	21 (91.3)	14 (42.4)	22 (95.7)
Wasting	8 (24.2)	7 (30.4)	15 (45.5)	5 (21.7)	13 (39.4)	2 (8.7)	12 (36.4)	1 (4.3)
Normal	0	0	4 (12.1)	0	5 (5.2)	0	7 (21.2)	0
Overweight	0	0	0		0	0	0	0
p-value	0.610		0.006		0.0001		0.0001	

*IG : Intervention Group; CG : Control Group; p value of Mann-Whitney test of differences between the groups

Table 4. Nutritional status of wasted children (Z score WHZ) by studied groups during the different phases

Z Score WHZ	Experimental (n=33)	Control (n=23)	Mean Diff (95% CI)	p-value
	Mean±SD	Mean±SD		
Baseline	-3.10±0.35	-3.21±0.29	0.11 (-0.07; 0.28)	0.25
After 1 months	-2.76±0.63	-3.18±0.23	0.41 (0.17; 0.65)	0.001
After 2 months	-2.78±0.67	-3.28±0.31	0.50 (0.23; 0.77)	0.00001
After 3 months	-2.78±0.74	-3.26±0.18	0.49 (0.22; 0.76)	0.001

*p value of t-test of differences between the groups

Table 3 and Table 4 shows there are no differences of nutritional status and Z score (WHZ) between experimental group and control group at the baseline (P> 0.05). Nutritional status appeared to increase after 1 month, 2 months and 3 months of intervention (P< 0.05).

Table 5. Effect of home care interventions to increase the z-score Weight for height WHZ)

Parameter	Estimates	95% CI	p*
Constant	-3.31	(-3.50; -3.12)	0.00
Intervention *Home care* (1) RUT-F (0) Time	 0.39 0.002	 (0.18; 0.61) (-0.00; 0.004)	 0.00 0.11

Home care and Ready to Use Therapeutic Food (RUT-F) with a linear mixed effect model analysis, shows that the home care intervention can increase z score, by 0.39 compared to RUT-F variable (Table 5).

Tabel 6. Relationship among home care intervention, time measurement and toddler's characteristic and increased z-score Weight for height (WHZ) using linear mixed effect model analysis

Parameter	Estimates	95% CI	p*
Constant	-3.09	(-3.81; -2.37)	0.00
Intervention *home care* (1) RUT-F (0. *ref*)	0.45	(0.24; 0.66)	0.00
Time	0.002	(-0.00; 0.004)	0.06
Age of children (month)	-0.0003	(-0.0006; -0.0001	0.01
Age of mothers (years)	0.007	(-0.008; 0.02)	0.36
Amount of children in family	0.006	(-0.21; 0.22)	0.43
Gender Male (1) Female (0. *ref*)	-0.25	(-0.45; -0.04)	0.02
History of exclusive breastfeeding Exclusive (1) Not exclusive (0. *ref*)	-0.24	(-0.45; -0.02)	0.04
Monthly family income ≥ Regional Minimum Wage (1) ≤ UMR Regional Minimum Wage (0. *ref*)	-0.03	(-0.28; 0.21)	0.49
Education of mothers High (1) Low (0. *ref*)	0.10	(-0.18; 0.39)	0.48
Education of fathers High (1) Low (0. *ref*)	-0.15	(-0.41; 0.12)	0.29
Care giver Mother (1) Not mother (0. *ref*)	0.13	(-0.15; 0.40)	0.38

*p<0,05 based on *linier mixed-effects model,* Time : length of time since the study was conducted, AIC (*Akaike Information Criterion)* : 482,18, *ref* : reference variable

Table 6 shows that home care variable, toddler age, sex and history of exclusive breastfeeding affected improvement of z score weight/height (WHZ) in malnourished under five children. Table 6 shows that age was negatively affected on z score, but the change is negative. Figure 1 below shows the graph of estimated increase in the z score weight / height by the age of five during the intervention

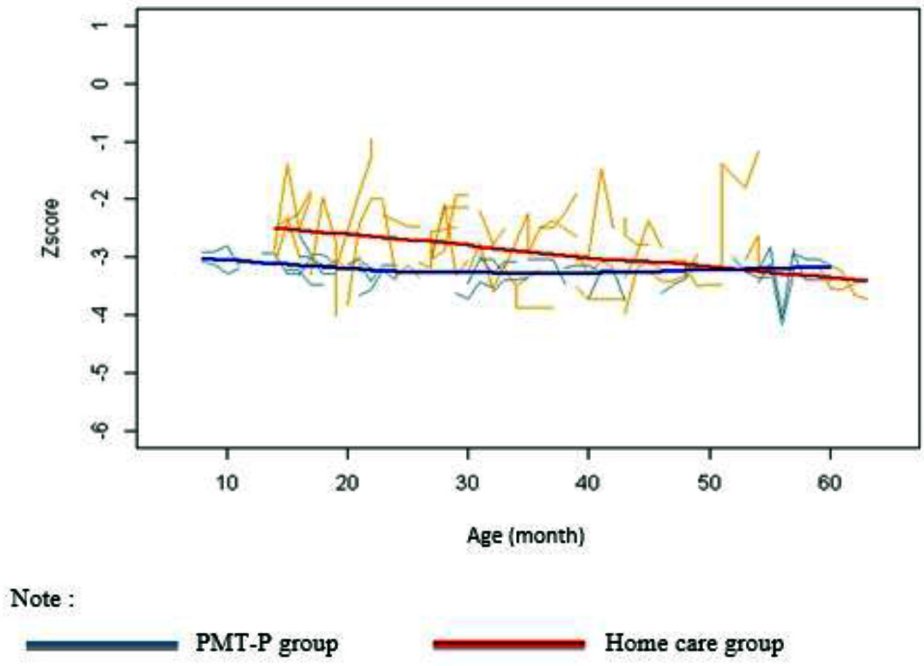

Figure 1. Z score estimates by the age of malnourished children

Figure 1. shows a difference between the two groups, increase in z-score WHZ by age in intervention group is higher than control group at age ≤ 50 months. Intercept was seen in the age group of 50-60 months, where control group showed better improvement than the intervention group.

DISCUSSION

The result showed that all malnourished children in both intervention group and control group were in moderate and severe acute malnutrition. Average z score of WHZ of malnourished children is -3.13 with standard deviation 0.34 in experiment group and -3.24 with standard deviation 0.23 in control group. This was similar to the characteristic of children in the study of Connor & Manary on community-based intervention on malnourished children which states that malnourished children have average z score of WHZ about -2.41 with standard deviation 0.31[6]. The study states that incidences of malnutrition in children commonly occur in urban area[7]. The sample in this study was all malnourished children in Yogyakarta which is also an urban area.

Characteristic of malnourished by age showed that average age of children is 33,24 months. Incidences of malnutrition usually present in the first 1000 days of life because it's the most risky age in terms of growth disorder and incidences of malnutrition[8-9]. The issue of malnutrition in children was the impact of low prevelance of exclusive breastfeeding until 6 months and incorrect supplementary food because it's given too early or too late.This was in accordance with several studies which state that most malnourished children do not get exclusive breastfeeding[10]. It is associated with lack of knowledge regarding breastfeeding, supplementary foods, inability to produce inadequate breast milk and sickness during breastfeeding period which generates malnutrition in children[11-12].

Modern community approach called community-based management of acute malnutrition is done focusing done managing children with acute malnutrition by using primary health services[13-14]. Community-based management of acute malnutrition has three main components including home care.

Nowdays, home care is suggested to improve the children's health[15]. This program has served over 500.000 families in United States and is currently being developed in Europe as supplementary program to improve family welfare[16,17]. Home care program is promoted by American Academy of Pediatrics (AAP) and several professional organizations as an optimal model in parenting. AAP states that home care program consists of 7 components which are affordability, family-centric, continuous, parenting coordination, love and cultural effectiveness[18].

Home care program has several benefits, including faster recovery of nutritional status of malnourished children, while management in health facilities such as hospitals and nutritional stabilization centers requires caretakers (mothers) to accompany their children and leave homes[19]. In practice, the capacity of rehabilitation centers for malnourished children in developing countries has several limitations, including lack of trained health personnel, inadequate number of beds compared to malnourished children, dense environment enabling cross infection due to low immune system of malnourished children. The locations of rehabilitation centers are far from malnourished children which make families are forced to leave home and travel to take their children to rehabilitation centers[19].

Home visit program by nurses in public health centers and state that during home visits, the services given include health review, counseling and health education, case management, coordination with health facilities in the communities and coordination with other health personnel[20-21]. The focus of home care intervention of malnourished children was nursing care. Nurses performed five stages of nursing process from reviewing, determining nursing diagnosis, making nursing plans, implementing intervention and making evaluation.

The most significant result (P = 0.0001) was obtained at the end on intensive phase after nurses made four visits in one month. Nutritional intervention program for 4 weeks significantly affects nutritional status of children and body composition of malnourished children[22]. Intensive visits gave an opportunity to nurses and mothers of malnourished children to give intensive care and mothers are also confident when caring for children[16].

CONCLUSION

This study showed that the nutritional status of children who undergo home care intervention improved significantly. Comprehensive educations regarding nutrition for parents, caregivers and children are encouraged. In addition, concerted efforts from all key partners and stakeholders in various organizations addressing the health and nutritional needs of children are needed.

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Knowledge and Perception of Eco-Friendly Environment among High School Students in Southern India- A Quasi Experimental Study

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ABSTRACT

Quasi experimental pre-test post-test control group design study was carried-out to find the effectiveness of a sensitization program on knowledge and perception on eco-friendly environment among high school students**.** The participants were 140 rural higher primary students of 8th and 9th standard. Knowledge questionnaire and perception scale was administered to collect data and Sensitization programme was given using teaching machine and lecture. The data was analyzed using descriptive and inferential statistics. The study found a significant difference in the post-test level of knowledge ('t' value is 24.47, p=0.0001) and perception (t' = 14.43 p=0.00001. Sensitization programme is an effective method to improve the children's knowledge and perception on eco- friendly environment.

Keywords*: eco-friendly environment, high school student, India, knowledge, rural, sensitization programme, Udupi District,*

INTRODUCTION

Eco-friendly environment refers to the green environment and the nature surrounding this earth. Every citizen has the responsibility to protect and preserve the nature. If everyone becomes conscious about preserving the environment, lot of harm for the people can be avoided and we can help the animals lead a normal life.

A study on Environmental education and its effects on knowledge and attitude among 300 preparatory school students was carried out in Egypt. The main aim was to measure the knowledge on environment among preparatory school students and determine the attitude on environmental concepts and to assess the effect of the environmental education. Stratified random sampling was done and questionnaire was used to collect data. Results of the study found that 77% of students had poor knowledge and 80% had negative attitude on environment. After the environmental education it was found that attitude was found to be positively correlated to their level of knowledge. Results support the need of development and implementation of environmental education program as a part of regular school curriculum[1].

A descriptive study on environmental awareness and environment related behaviors was carried out among 360 twelfth grade students in Kolkata. Two five point likert type questionnaires were included in the study. The results of the study found that there was a positive relationship between gender and stream with environmental awareness and environmental behavior. Girls were more eco-friendly than boys and science background students were relatively more knowledgeable than other stream[2].

Lack of knowledge among participants about environmental health related issues were reported in a survey conducted among 395 college students in America. Males were reported to have positive

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attitude towards issues relating to air quality and the green environment. There was significant relationship between age and attitude towards issues dealing with sustainability[3].

MATERIALS AND METHOD

Objectives of the study were to assess the knowledge and perception on eco-friendly environment and to find the effectiveness of a sensitization program on eco-friendly environment among high school students. A Quasi experimental pretest post-test control group design was used for this study. Inclusion criteria was children from 8th and 9th standard in rural high schools. Children who were absent during data collection period were excluded from the study. Simple random sampling was used to select the schools and students were selected by using purposive sampling. The sample of the study consisted of 140 (70 in experimental and 70 in control group) higher primary school children studying in 8th and 9th standard, studying in rural Kannada medium high schools. The study was approved by the Institutional Ethical committee (IEC) of Kasturba hospital Manipal (IEC676/2015) and data was collected after the approval from district block officer, principals of high schools and written consent from the participants.

Data was collected by the primary investigator in the high schools using demographic proforma and structured knowledge questionnaire and perception scale on eco-friendly environment. The knowledge questionnaire had 60 multiple choice questions prepared by the researcher on the area of air, light, water, thermal, noise, chemical, land and general areas of environment. Correct response for each item was given a score of one and wrong or unanswered items were scored as zero. The maximum score possible was 60. The knowledge score was categorized as good, average and poor.

The tool on perception regarding eco-friendly environment was constructed by the researcher on seven elements of earth (air, light, water, thermal, noise, chemical and land). The total number of items were 60. Each item was rated against three point rating scale as agree, uncertain and disagree. The perception score was categorized as Good, and average.

Content validity was established by taking suggestions from experts. The reliability of the tools were assessed by administering the tool to 20 students studying in 8th and 9th standard. Reliability was established by split half method and reliability coefficient of knowledge questionnaire was 0.82 and perception scale was 0.8. Sensitization programme had the content in the areas of ecofriendly environment such as air, water, land, light, chemical, thermal, noise and general areas of environment.

The data were collected in the month of December 2015 and January 2016.The Pretest was conducted on day one by administering the knowledge questionnaire and perception tool on eco-friendly environment. Experimental group students attended the teaching on eco-friendly environment through lecture method and the teaching machine was used as a teaching aid for teaching and evaluation. On the 14th day, post-test was conducted by administering same structured knowledge questionnaire and perception for both the groups. Control group did not receive intervention. The data was analyzed by both descriptive and inferential statistics using SPSS (statistical package of social science) version 16.0 software.

FINDINGS

Sample characteristics

Table 1: Frequency and percentage distribution of sample characteristics N=70+70= 140

Sample Characteristics	Experimental Group		Control Group	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Age (in Years)				
12 to 13	28	40	31	44.29
14 to 16	42	60	39	55.71

***Cont...*Table 1: Frequency and percentage distribution of sample characteristics N=70+70= 140**

Gender				
Male	23	32.86	37	52.86
Female	47	67.14	33	47.14
Class				
8th	31	44.29	32	45.71
9th	39	55.71	38	54.29
Religion				
Hindu	60	85.71	69	98.57
Muslim	9	12.86	1	1.43
Christian	1	1.43	0	0
Previous Knowledge				
Yes	60	85.71	62	88.57
No	10	14.29	8	11.43
Illness				
Yes	61	87.14	56	80
cough	35	50	21	30
cold	20	28.57	13	18.57
fever	4	5.71	19	27.14
All	2	2.86	13	18.57
No	9	12.86	14	20

The data presented in table 1 shows that in experimental and control group 42 (60%) and 39 (55.71%) children belonged to the age group of 14- 16 years. In these group 31 (44.28%) and 32 (45.71 %) were from eighth standard and 39 (55.71 %) and 38 (54.28 %) from ninth standard. In the experimental and control group 60(85.71%) and 62(88.57%) had previous knowledge on environmental pollution. Students who had illness related to environment were 61(87.14%) and 56(80%) in experimental and control group respectively. Most of them reported to have cough related to change in environment which was 35 (50%) in experimental group and 21(30%) in control group respectively.

Knowledge of students on ecofriendly environment

Table 2: Frequency and percentage distribution of knowledge of students on eco- friendly environment N=70+70= 140

Knowledge score	Pretest				Posttest			
	Experimental group		Control group		Experimental group		Control group	
	(f)	%	(f)	%	(f)	%	(f)	%
>80% = Good	0	0	0	0	13	18.57	0	0
41-80% = average	46	65.71	47	67.14	57	81.43	25	35.71
<40%= Poor	24	34.29	23	32.86	0	0	45	64.29
Mean ± SD	25.76 ± 4.99		25.63 ± 4.88		42.8 ± 5.79		21.84± 4.22	

In the pretest, majority of the high school children in experimental and control group had average knowledge of 46 (65.71%). After the sensitization program, in the experimental group, 13 students out of 70 had good knowledge (18.57%) and there were no students who had poor knowledge. In the control group there were differences between the pre-test and posttest knowledge. The students in the poor category were more compared to the pretest.

Table 3: Frequency and percentage distribution of pretest and posttest perception on ecofriendly environment N=70+70= 140

Perception score	Pre test				Post test			
	Experimental group		Control group		Experimental group		Control group	
	(f)	%	(f)	%	(f)	%	(f)	%
75% & above Good	52	74.29	51	72.86	68	97.14	35	50
<75%= Average	18	25.71	19	27.14	2	2.86	35	50
Mean ± SD	58.68 ± 4.58		59.53 ± 5.25		66.83 ±3.86		56.18 ± 4.81	

The data presented in table 3 shows difference in the practice scores of experimental and control group. There was increase in the perception scores in the experimental group whereas in the control group posttest perception scores were found to be lesser that the pretest.

Effectiveness of sensitization program:

Table 4: Comparison of posttest knowledge and perception scores of experimental and control group N=70+70= 140

Variable	Mean		Standard deviation	Std error	Mean difference	't' value	df	p value
Knowledge								
Experimental group	42.8		5.79	0.69	20.96	24.47	126	0.000
Control group	21.84		4.22	0.50				
Perception								
Experimental	66.83		3.86	0.46	10.65	14.43	132	0.0000
Control	56.18		4.813	0.575				

The mean post-test knowledge score of high school students in the experimental group was higher (42.8) when compared the control group (21.84). 't' test computed showed a significant difference in the post-test knowledge scores between experimental and control group (t = 24.47,p=0.000).

Similar trend is seen in the post- test perception scores between experimental and control group. 't' test computed showed a significant difference in the post-test perception scores between experimental and control group(t = 14.43,p=0.0000). Thus it can be inferred that sensitization program was effective in improving the knowledge and perception of high school students on eco- friendly environment.

DISCUSSION

Environment protection starts by creating awareness among the people so that it becomes the part of their life style. The main objective of environmental education was awareness, knowledge, attitudes, skills and participation of people in protecting environment [4]

In this study, it was observed that majority of high school children had average knowledge of 46 (65.71%) in experimental group and 47 (67.14%) in control group

and remaining had poor knowledge whereas no one were scoring good knowledge on eco-friendly environment. In experimental and control group 52 (74.29%) and 51 (72.86%) had good perception on eco-friendly environment and remaining had average perception.

A study on environmental awareness and practices among undergraduate students with reference to arts and science in Dindigul district, Tamil Nadu showed that level of awareness was high among respondents and males practice more than females (r = 0.116 and p= 0.049)[8].

A study of knowledge on consequences and practices about environmental pollution of secondary level students in Bangladesh among 220 students of secondary level education of Dhakha revealed that students had misconception regarding the environmental pollution. But in some cases they had rationale and positive aspect about environmental knowledge on impact and practice[9].

CONCLUSION

Awareness programs on environmental aspects when conducted in schools will help the students to become aware and about the environment. Sensitization of children in the schools will help them develop knowledge and become responsible to prevent environmental pollution and sustain the healthy environment.

Conflict of Interest – Not Applicable

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Equity in Health Care Coverage in Urban and Rural Community- Crossectional Analysis of Immunization Coverage and its Determinants

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ABSTRACT

Background: Equity of health coverage and its impact have led to initiatives to collect and analyze data on how health outcomes and services are distributed across social and economic groups. Socioeconomic status is an important determinant of the standard of living and health status as it influences the incidence and prevalence of various health conditions. Wealth-based inequalities in health care provision and utilization are endemic to the developing world and India is no exception.

Objectives: The study intended to analyse the factors associated with immunization coverage and compare various socioeconomic determinants associated with the effective utilization of health coverage in rural and urban areas in relation to the immunization coverage.

Material and Method: The study was a cross-sectional analytical study. The mothers/ reliable informants in the family were individually interviewed, using a pre-tested structured questionnaire.A child was categorized as fully immunised, non-immunised, partially immunised and Immunised for Age.

Results: Overage of vaccines under UIP at urban & rural communities showed a marked variation. In both urban & rural communities there was a significant association between Immunisation coverage & mothers education. The main reason for missed immunization observed was ignorance 35.4% & 45.3% respectively at rural & urban community. Other common reasons include casual attitude of the parents (18.5% in urban area) and sick child (13% in rural area). Gender differential was evident in the immunisation coverage. Lower birth order had a favorable chances to get vaccinated. There exists a wide gap in the knowledge regarding correct age of administration, doses, place of vaccination.A well established primary health care setup was seen at rural community but no such provision at urban community.

Conclusion: The need of the hour is an equitable, participatory and intersectoral approach to health and health care. Provision of vaccination should not be treated as the sole responsibility of the health sector. Convergence, De-centralization, community participation and Social inclusion is the need of the hour.

Keywords: *Immunisation, Urban, rural, Comparative, Dropout.*

INTRODUCTION

Equity of health coverage and its impact have led to initiatives to collect and analyze data on how health outcomes and services are distributed across social and economic groups. Socioeconomic status is an important determinant of the standard of living and health status as it influences the incidence and prevalence of various health conditions. Wealth-based inequalities in health care provision and utilization are endemic to the developing world and India is no exception. Despite efforts put by governmental as well as non-governmental institutes for 100% immunization coverage, there are still pockets of low coverage areas existing in India. Wealth-based inequalities in health care provision and utilization are endemic to the developing world

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and India is no exception. The state of child health in urban slums is comparable to those in rural areas and in some cases even worse. Contrary to the fact that rural communities are lagging behind in health coverage, even the underprivileged urban community living in slums are equally affected. Discrimination of girls in both preventive and curative care are also reported with varying degrees amongst the states. Index of immunisation and school attendance indicate consistent and sharper sex differences suggesting systematic neglect of girls. A good indicator of accessibility and outreach in the health care sector is the state of childhood immunization. Roughly 3 million children die each year of vaccine preventable diseases (VPDs) with a disproportionate number of these children residing in developing countries. Vaccines remain one of the most cost- effective public health initiatives, yet the cover against VPDs remains far from complete. Estimates suggest that approximately 34 million children are not completely immunised with almost 98 per cent of them residing in developing countries. [1,2]

India, along with the whole world, stands committed to the welfare of children. Numerous proactive steps have been taken by successive governments to ensure health equity. The Expanded Program on Immunisation (EPI) was launched by the WHO and UNICEF in 1974 globally following the eradication of smallpox with focus on prevention of the six childhood vaccine-preventable diseases. In India, immunisation has always been a central goal of the health care system. Despite only fully protecting about half of all infants, infant mortality rate (IMR) has declined gradually. IMR continued to decline after 1990. The Child Survival Safe Motherhood (CSSM) and Reproductive Child Health (RCH) programmes started in 1992 and 1997 respectively. Both of these programmes included the UIP as a key component and built upon the infrastructure developed for the UIP. Mission Indradhanush launched by the Union Government of India on December 25, 2014 aims to cover all those children who are unvaccinated or are partially vaccinated against seven vaccine preventable diseases which include diphtheria, whooping cough, tetanus, polio, tuberculosis, measles and hepatitis B, by the end of the year 2020.

Socioeconomic status influences social security in terms of the accessibility, affordability, acceptability and actual utilization of various health facilities. Although immunisation is but one element of public health services, differential achievements between states, rural/ urban areas, and socioeconomic groups give important information about overall health sector policies. There is a need to study factors which influence, affect and drive the acceptance and utilization of health care facilities.

AIMS AND OBJECTIVES

The study intended to analyse the factors associated with immunization coverage and compare various socioeconomic determinants associated with the effective utilization of health coverage in rural and urban areas in relation to the immunization coverage.

MATERIAL AND METHOD

The study was a cross-sectional analytical study, conducted at a rural community & an Urban slum in the state of Maharashtra, India. All children in preschool age group (0-60 months) in these areas were included in the study.The total population (100%) of pre-school children (0-60 months) in both these areas were included in the study. Houses were visited from one direction on each lane/street, taking the house numbers in consideration. A total of 136 children who fulfilled all the criteria required for the study were studied from the rural community. At urban slum a total of 116 children fulfilled the criteria.

The mothers/ reliable informants in the family were individually interviewed, using a pre-tested structured questionnaire. The Questionnaire included questions about household identification data, educational status and occupation of the parents, income of the family, utilization of child health services and reasons for non-utilization if any. Immunization coverage was ascertained from information on immunization cards, where these were available, and mother's report where these cards were not available. The Socio economic scales employed in the study was Kuppuswamy's socioeconomic status scale. It is well understood that the above scale is hardly used for rural community, however the study intended to compare various factors amongst urban and rural community. Hence a common scale was used for both the communities. The living siblings were taken into consideration for the birth order of living children

A child was categorized as fully immunised if that child has received one dose of BCG, three doses each of DPT and OPV and one dose of measles vaccine by the time of the survey. Child was categorized as non-

immunised if that child has received none of these vaccines by the time of the survey. Child was categorized as partially immunised if he has received at least one immunization but has not completed the immunization as per fully immunised status. A fourth category Immunised for Age was taken for those children who have received immunization as per their present age but has not yet completed the entire immunization schedule. The reason for taking this category into consideration was that even if they were immunised for age they might still default in immunization due to various reasons in coming years. During analysis the four Immunisation coverage groups were clubbed into two groups. The Fully immunized and Immunised for age were included as immunisation appropriate whereas Partial & Non immunised children were grouped as Immunisation default. Migrant population visiting their friends and relatives residing in these areas were also considered in the study. from the study.

RESULTS

The age-wise distribution of children showed that in rural community 28% children were in age group 31 - 40 months and at urban community the predominance was in age groups 10 – 30 months. Both the population showed predominance of male child. 65.45% children in rural and 60.3% in urban communities were male. The distribution as per birth order showed that in rural community 45.6% were in birth order 2 and in urban community 49% were of birth order 1. The educational status of mothers showed that 12.5% women in rural &4.3% in urban community were uneducated. Only 21.3% women in rural community had education of 10yrs & above. In rural area the major occupation was found to be farming (30.9%) followed by unskilled workers, whereas in urban area skilled workers were predominant (37.1%).52% children in rural community belonged to SES class IV i.e. upper lower class. At urban community 56% belonged to this class. Children in Lower SES class (class IV) were higher at rural community (10.3%) as compared to 4.3% in urban community. The Immunisation coverage at Urban community showed that 65.5% children were fully immunised whereas same at rural community it was 44.9%. The children who were partially immunised were 29.3% & 41.9 % in urban & rural community.2.6 % children in urban community have not been immunised at all & the same rural community it was 11%. There was clear correlation between Immunisation coverage & domicile, which was statistically significant. (Table1,2)

Social determinants affecting Immunisation coverage

In Urban community, male children appropriately immunised were 70 % whereas the same for females was 65.2%. In rural community, however, the difference is more marked, with 60.7% male children appropriately immunised, as against only 25.5% female children. The difference among genders in rural area was statistically significant. While in urban community 84.6% of children of birth order >2 were appropriately immunised, only 15.8% of these children in rural area received appropriate immunisation. This was a statistically significant finding. In both urban & rural communities there was a significant association between Immunisation coverage & mothers education. As the mother's education increased the immunization coverage also improved.

At both the communities the main source of information was the doctors. At rural community, Anganwadi worker (AWW) played a significant role in providing information to the mothers about the immunization. In both the communities, the main reason observed was ignorance 35.4% & 45.3% respectively at rural & urban community. Other common reasons include casual attitude of the parents (18.5% in urban area) and sick child (13% in rural area). Though a considerable number of respondents had satisfactory knowledge about the Universal immunization programme, respondents' inability to name or identify diseases other than tuberculosis and poliomyelitis was evident at both the communities. There exists a wide gap in the knowledge regarding correct age of administration, doses, place of vaccination.A well established primary health care setup was seen at rural community but no such provision at urban community. The most of medical care was clinic oriented and no urban health post was established in the community or in vicinity for the residents.As most of them were from a low SES & involved in unorganized work sectors, not many were availing the facilities of health insurances. (Table 3,4,5,6)

Table 1: Urban- Rural distribution as per SES

U/R	Lower (V)	Upper Lower (IV)	Lower Middle(III)	Upper Middle (II)	TOTAL
Rural (%)	14 (10.3)	72 (52.9)	46 (33.8)	4 (2.9)	136 (100.0)
Urban (%)	5 (4.3)	65 (56.0)	41 (35.3)	5 (4.3)	116 (100.0)
TOTAL (%)	19 (7.5)	137 (54.4)	87 (34.5)	9 (3.6)	252 (100.0)

Table 2: Urban Rural Differences in Immunisation Coverage

	Fully Immunised	Immunised for Age	Not immunised	Partially immunised	TOTAL
Urban (%)	76 (65.5)	3 (2.6)	3 (2.6)	34 (29.3)	116 (100.0)
Rural (%)	61 (44.9)	3 (2.2)	15 (11.0)	57 (41.9)	136 (100.0)
TOTAL (%)	137 (54.4)	6 (2.4)	18 (7.1)	91 (36.1)	252 (100.0)

Chi square: 1021.9; df: 3; $p<0.05$

Table 3: Gender differential in Immunisation coverage

Sex	Immunisation Appropriate	Immunisation Default	TOTAL
Male (%)	54 (60.7)	35 (39.3)	89 (100.0)
Female (%)	12 (25.5)	35 (74.5)	47 (100.0)
Total (%)	66 (48.5)	70 (51.5)	136 (100.0)

Chi square: 13.83; df: 1; $p<0.05$

Table 4: Birth order and Immunisation coverage

Immunisation Coverage	Urban			Rural		
	≤2	>2	Total	≤2	>2	Total
Immunisation Appropriate (%)	68 (66.0)	11 (84.6)	79 (68.1)	63 (53.8)	03 (15.8)	66 (48.5)
Immunisation Default (%)	35 (34.0)	02 (15.4)	37 (31.9)	54 (46.2)	16 (84.2)	70 (51.5)
Total (%)	103 (100.0)	13 (100.0)	116 (100.0)	117 (100.0)	19 (100.0)	136 (100.0)

Table 5: Mother's Literacy & Immunisation coverage in urban community

Immunisation Coverage Group			
Mothers Edn	**Immunisation Appropriate**	**Immunisation Default**	**Total**
10yrs & above (%)	39 (72.2)	15 (27.8)	54 (100.0)
8-9yrs (%)	16 (80.0)	4 (20.0)	20 (100.0)
<8yrs (%)	22 (59.5)	15 (40.5)	37 (100.0)
No Education (%)	2 (40.0)	3 (60.0)	5 (100.0)
Total (%)	79 (68.1)	37 (31.9)	116 (100.0)

Chi square: 468.8; df: 3; $p<0.05$

Table 6: Reasons for partial Immunisation / Reasons for Non Immunisation of the child

	Rural (%)	Urban (%)
Ignorance	22.4	29.2
Unaware of need for immunisation	13	16.1
Unaware of need to return for 2nd and 3rd dose	8.3	7.1
Fear of side effects	4.7	2.4
Fear that vaccine would cause the disease	3.5	7.1
Place and time unknown	2.8	3.6
Casual attitude	9.4	18.5
No faith in immunisation	2	1.8
Rumours	0.8	0
Distance from health center	0.8	0
Sick Child	17.7	8.9
Non availability of vaccines	1.6	1.2

DISCUSSIONS

Rural urban difference in immunization coverage has been significant in most of the studies, with favourable outcome in urban areas as compared to rural. The drop out rate for DPT and OPV was also less in urban and semi-urban than in the rural areas. Gender differential was significant in the rural community. A number of studies have drawn attention to the problem of discrimination against the female child. They have shown that immunization coverage of female children is lower than males. Various studies have shown the relation of birth order with immunization coverage. The levels of immunization coverage were better in lower birth order as compared to the higher birth orders. There was a significant association between immunisation coverage & mothers education. As the mother's education increased the immunization coverage also improved. Education of women is directly related to the fertility pattern and also to other child-health indicators. Mother's education has an important influence over child health care choices related to immunisation.[3,4,5] This positive effect is purely driven by the knowledge and awareness associated with maternal education. At both the communities the immunization coverage significantly increased as per SES. The main reason observed was ignorance, which was 35.4% & 45.3% respectively at rural & urban community. Other common reasons include casual attitude of the parents (18.5% in urban area) and sick child (13% in rural area). Various studies over the years have suggested a number of causes of low immunisation coverage.

A well established primary health care setup is seen at rural community but no such provisions exist on ground at urban communities. The most of medical care is clinic oriented. The recommendations for urban communities to have urban health post still are far from implementation in the area.is no uniform set of norms for urban health posts. In rural areas, an ANM/AWW visits the village and provides community-based services. This is not true for urban slums. Women have to go to a hospital or dispensary to avail of basic services such as immunisation of their children or antenatal care during pregnancy. As a result the urban poor have to spend time and money in travel to the hospital/dispensary to avail of services. There exists no uniform set of norms for urban health posts. It is a well known fact that immunization is higher for children from urban areas as compared to the rural communities but a striking feature which appeared in the study was that the urban slums who belong to the under-privileged lot in the cities are equally affected and the immunization coverage in this area, though marginally higher than the rural community, still lags to a greater extent. [6]

CONCLUSION

Focused efforts to strengthen routine immunization programme especially in the underprivileged groups and areas such as slum in cities is the need of the hour so that target of universal coverage can be achieved as envisaged at national level. An equitable, participatory and intersectoral approach is an important component for equity in health care. Provision of vaccination should not be treated as the sole responsibility of the health sector. Convergence, De-centralisation, Community participation and Social inclusion is the need of the hour. Intensive Health education undertaken to enhance respondents' knowledge about the complete UIP program and to minimize the gaps regarding the knowledge about correct age of administration, doses, place of vaccination would go long way. Evidence-based approach to social mobilisation; develop and provide locally sensitive and appropriate and field-tested IEC resources.

Conflict of Interest – Nil

Source of Funding- Self

Ethical Clearance – Institutional ethical clearance taken

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Health Risk Assessment and Vulnerability of Children in Flood Prone Area of Makassar

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ABSTRACT

Indonesia is highly vulnerable to disasters such as floods, volcanic eruptions and others. These will expose those who live in the disaster-prone areas to flood, which in time will lead to the exposure of environmental-based diseases. This study aims to explore the vulnerability of health risk assessment and children under five years old in flood-prone areas of Manggala village Tamangapa District of Makassar.

This study was driven by cross sectional study design. The data collection was performed by direct interview using a questionnaire to a number of respondents in 129 houses and 53 children aged 1-4 years at Tamangapa, direct observation and sampling faeces. The data are processed using SPSS utilising statistical test Chi Square and applied Environmental risk category by the approach of Environmental Health Risk Assessments (EHRA).

The results reveal that the environment of flood-prone areas that are in RT 04 RW 06 in the category of risk is very high at 229 with an index value of environmental health risks 212-229. Meanwhile, RT 04 RW 05 are in the category of less risk in the amount of 155 with an index of 155-173. While the children under five years old obtained as much as 13.2% positive infected with *Ascaris lumbricoides*. Means of existing toilet ($p = 0.030$) and nail hygiene ($p = 0.041$) significantly affect the incidence of worm infection on children under five years old in flood prone areas of Tamangapa, Makassar.

The study concludes children under five are vulnerable to environmental based diseases in floods prone areas in Makassar and it is highly recommended to people living in the prone area to be more concerned with the hygiene and environmental health sanitation.

Keywords: *children under five years old, flood prone areas, EHRA, Makassar.*

INTRODUCTION

Floods occurred in several areas in Indonesia almost every year as what happened in Pulo Kampung, Jakarta in 2013. Thousands of families had to be evacuated because of the overflow of Ciliwung River. In Semarang, the flood of Pelem River had an impact on the houses; 2 houses destroyed, 22 soaked in water, and 280 hectares of rice fields were destroyed. The development in Makassar resulted in the city's vulnerability to flood highly every year. In 2013, floods drenched the District of Manggala, causing 2,461 houses inundated with 9.657 people affected and 4.555 people were evacuated to the safer place[1,2,3]. They might be exposed to diarrhea, acute respiratory diseases, helminth and many more. It is affected by the habitat management and environmental management.[4]

Environmental Health Risk Assessment (EHRA) is a study of the condition of sanitary facilities and behaviors that might be risky to public health. The facility under study include Clean Water Source (SAB), the toilets, household trash management, and Household Waste Water Drainage (SPAL). For behavioral aspects, the focuses are on Handwashing using soap (CTPS) and of waste sorting behaviour and random defecation (Babs). In this study, it will also be conducted distribution or

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mapping of environmental health risks. [5, 6.7]. The data from Indonesian Ministry of Health showed that the presentation of the population had access to proper sanitation facilities in 2011 was only 54.99%. This indicated that less than half of Indonesia's population still have not good sanitation facilities[8,9].

There are some flood prone areas in Romang Tangngaya which is in RT 04, RW 06 and Bontoa RT 04 RW 05. The topography is in the lower plains of the surrounding area and is located on the left side of the Kajenjeng River, In fact, water is often submerged the areas in two to three months every years[10]. This research therefore will focus on health risk assessment and vulnerability of children in flood prone area of Makassar.

MATERIALS AND METHOD

This research was an analytic observational study with cross-sectional study design. The study was conducted in flood prone areas Tamangapa Village District of Manggala using adopted questioner from RISKESDAS and examination of stool samples was conducted by sedimentation in the Laboratory of Health Analyst Health Polytechnic Makassar. This research was conducted from 8 December 2015 to Januarry 2016. The population in this study are all households in RW. 5, RT. 4 (Bontoa) and RW.6, RT. 4 (Romang Tangaya) flood-prone areas Manggala village Tamangapa District of Makassar City consisting of 129 houses, 72 houses in Bontoa and 57 in Romang Tangaya. The stool samples were from all of children aged 1-4 years residing in both areas. Because the population were relatively small, they were made into exhaustive sample with the proviso willing subjects. The data were collected through interviewing the mothers, direct observation and children stool sample examination. The data are processed using SPSS and Arc View GIS applications. Environmental risk category is determined by the approach of Environmental Health Risk Assessments (EHRA). The data were analyzed with univariate and bivariate with chi square test. Presentation of data in tables and accompanied by a narration.

RESULTS

The result indicates that the majority of respondents live in their own houses as many as 115, or 89.1%, respectively scattered on RT 05 RW 04, as many as 58 houses and at RT 06 RW 04, as many as 57 houses. Of the two research sites existing in the Village of Tamangapa, the majority of the population has a house-on stilts type with a total of 74 houses or 57.4%, respectively scattered on RT 05 RW 04, as many as 27 houses and at RT 06 RW 04, as many as 47 houses.

The number of respondents for the data collection was 46 mothers of under five-year old children with 53 stool samples consisting of 28 samples from Bontoa RT IV/RW V and 25 from Romang Tangaya RT IV/RW VI. The children under five that became respondents were 3 years old (54%)and more male than female while in RT IV/RW VI were more female than male (64%) (Table 4 and 5). For the purposes of water boiling, the most widely used is also water from unprotected well as many as 39 or 30.2%, and the least is the water from unprotected springs as much as 1 or 0.8%. For toilets use as many as 40 or 31%, use water from unprotected well and the least is the water from unprotected springs as much as 1 or 0.8% (Table 1).

Most houses had individual septic of 92, or 71.3%, while those who did not have were 37 or 28.7% and they defecate there were as many as 92 or 71.3% use private toilet and 1 or 0.8% used pit (Table 2). The respondents who have a trash can as much as 29 or 22.5% and the number of respondents who did not have more precisely by 100 or 96.1%.

Based on the four variables to be used, an index table of health risk of environmental disease was obtained. The cumulative results showed that the accumulation of RT 04 RW 06 with an index value of 229 environmental health risks, is in the category of risk of very high. Meanwhile, RT 05 RW 04 was with an index value of 155 environmental health risks, is in the category of less risk (Table 3). The results are shown in the map by the program of Arc View GIS. It presented digitization and labeling of each point coordinate used to obtain environmental health risk categories (Figure 1, Figure 2).

Meanwhile, the number of respondents were 46 mothers with the unit of analysis of 53 samples of children's faeces t, 28 respondents in Bontoa RT IV/RW V and 25 respondents in Romang Tangaya RT IV / RW VI. The age of the child respondents were 3 years of age (36%). Most respondents gender were male at RT IV / RW V (54%), while at RT IV / RW VI more respondents were female (64%) (Table 4 and 5).

Table 1. Water supply distribution in flood prone area in Tamangapa, Makassar

Water Supply Distribution	RW/RT				Total	
	05/04		06/04			
	n	%	n	%	n	%
Drinking Water						
Bottled water	5	6.9	0	0	5	3.9
Water refilled	27	37.5	0	0	27	20.9
Drilled Wells	7	9.7	14	24.6	21	16.3
Protected wells	11	15.3	8	14	19	14.7
Un-protected Wells	5	6.9	34	59.6	39	30.2
Protected artesis	0	0	0	0	0	0
Un - Protected artesis	0	0	1	1.8	1	0.8
Rain water	0	0	0	0	0	0
Pipe water	17	23.6	0	0	17	13.2
Masak						
Bottled water	1	1.4	0	0	1	0.8
Water refilled	5	6.9	0	0	5	3.9
Drilled Wells	18	25	14	24.6	32	24.8
Protected wells	15	20.8	8	14	23	17.8
Un-protected Wells	5	6.9	34	59.6	39	30.2
Protected artesis	0	0	0	0	0	0
Un - Protected artesis	0	0	1	1.8	1	0.8
Rain water	0	0	0	0	0	0
Pipe water	28	38.9	0	0	28	21.7
MCK						
Bottled water	0	0	0	0	0	0
Water refilled	4	5.6	0	0	4	3.1
Drilled Wells	21	29.2	14	24.6	35	27.1
Protected wells	16	22.2	8	14	24	18.6
Un-protected Wells	5	6.9	34	59.6	39	31
Protected artesis	0	0	0	0	0	0
Un - Protected artesis	0	0	1	1.8	1	0.8
Rain water	0	0	0	0	0	0
Pipe water	26	36.1	0	0	26	20.2
Total	**72**	**100**	**57**	**100**	**129**	**100**

Source: Primary Data, 2016

Table 2. Distribution of toilets, Defecation place and type of toilets in prone area of Tamangapa, Makassar

Distribution of toilets. Defecation place and type of toilets	RW/RT				Total	
	05/04		06/04			
	n	%	n	%	n	%
Have Toilets						

Cont... **Table 2. Distribution of toilets, Defecation place and type of toilets in prone area of Tamangapa, Makassar**

Yes	64	88.9	28	49.1	92	71.3
No	8	11.1	29	50.9	37	28.7
Defecation Place						
Own Toilets	64	88.9	28	49.1	92	71.3
Public toilets	8	11.1	23	40.1	31	24
Around the houses	0	0	3	5.3	3	2.3
Holes	0	0	1	1.8	1	0.8
Neighbors toilets	0	0	2	3.5	2	1.6
Toilet type						
Squatting	62	86.1	17	29.8	79	61.2
No Tank	8	11.1	29	50.9	37	28.7
Direct Tank	0	0	8	14	8	6.2
Sitting	2	2.8	1	1.8	3	2.3
Holes	0	0	2	3.5	2	1.6
Total	72	100	57	100	129	100

Source: Primary Data, 2016

Table 3. Risk Score of Environmental Health Assessments in Flood Prone area Tamangapa, Makassar

RW/RT	Risk Score	Risk Category
05/04	155	Less risk
06/04	299	High risk

Source: Primary Data, 2016

Table 4. Respondent Distribution based on Helminthiasis in Flood prone area of Tamangapa, Makassar

Helminthiasis	RT IV/RW V		RT IV/RW VI		Total	
	n	%	n	%	n	%
Positif	2	7.2	5	20.0	7	13.2
Negatif	26	92.8	20	80.0	46	86.8
Jumlah	28	100.0	25	100.0	53	100.0

Source: Primary Data, 2016

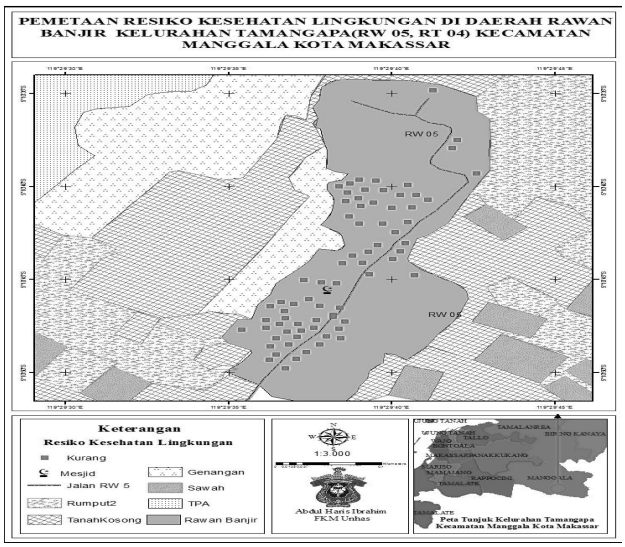
Table 5. Respondents Distribution based on risk factor of helminthiasis on children under five in flood prone area Tamangapa, Makassar

Risk Factors	n	%
Water Supply		
Not qualified	53	100.0
Qualified	0	0
Total	53	100.0

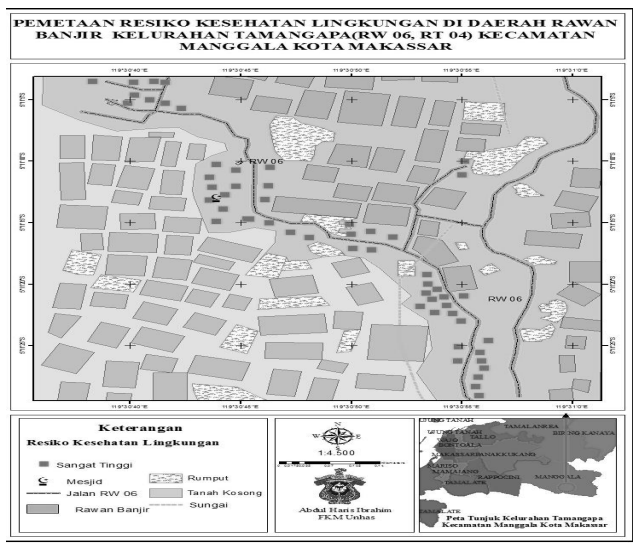
Cont... **Table 5. Respondents Distribution based on risk factor of helminthiasis on children under five in flood prone area Tamangapa, Makassar**

Toilets		
Not qualified	11	33.3
Qualified	22	66.7
Total	33	100.0
Sewage		
Not qualified	49	92.5
Qualified	4	7.5
Total	35	100.0
Solid Waste		
Not qualified	51	96.2
Qualified	2	3.8
Total	53	100.0
Washing hands		
Not qualified	45	84.9
Qualified	8	15.1
Total	53	100.0
Sandals	**n**	**%**
Not qualified	34	64.2
Qualified	19	35.8
Total	**53**	**100.0**
Clean Nails	**n**	**%**
Not qualified	34	64.2
Qualified	19	35.8
Total	53	100.0

Source: Primary Data. 2016



Picture 1. Mapping of Environmental Health Risk RW 05 RT 04 - Low Risk in Purple - in Flood prone area in Tamangapa, Makassar



Picture 2. Mapping of Environmental Health Risk RW 06 RT 04 – High Risk in Green - in Flood Prone area Tamangapa, Makassar

DISCUSSION

The study found that most households using water from unprotected wells to meet the daily life needs (30.2%). On the other hand, many also used water originating from the an artesian well. Topography of an area can affect groundwater in the area. In low-lying area, the frequency of ground water is relatively large because in this area the population grew rapidly while the population growth plateau area was slower because the area was located at the slope of the hill[10,11].

It was also discovered in this study that the intensity of the public waste disposal indicated that 45% of respondents disposed their garbage every day. Assessing from 5 critical times in washing hands, it was concluded that no one was doing appropriate hand washing at critical times. The main reason was the poor knowledge of the importance of handwashing with soap and it was also the lack of access to clean water. Some studies revealed that incidence of diarrhea was very often caused by the pollutants and pathogens from other areas carried by the floods. The processes of transmission of the disease were influenced by the characteristics of the host's immunity, nutritional status, health status, age, and gender as well as the behavior of its host (personal hygiene and food hygiene)[13,14] as determined by EHRA.

Every index value of environmental health risks obtained was accumulated at each study site and the value obtained in RT 04 RW 05 was 155 whereas the value gathered in RT 06 RW 04, was 229. From these values, it can be determined that there were four categories of vulnerability of the areas: less risk, moderate, high, and very high are respectively: 155- to 173,174 to 192,193-211 and, 212 and 229. The results showed that respondents who have excreta disposal facilities influenced the incidence of worm infection in infants. Statistical test results indicated a value of $p = 0.031$ ($p < 0.05$. This means there is a relationship between the means of excreta disposal and the incidence of intestinal worms in children under five in the areas prone to flooding.

The variables nail hygiene also has an influence on the incidence of intestinal worms. This means that there is a relationship between nail hygiene and the incidence of worm infection in infants in flood prone areas (Table 5). Another case with variable water supply, SPAL ($p = 1.000$), the place and waste treatment ($p = 1.000$), hand washing habits ($p = 0.395$), and wearing footwear ($p = 0.084$) had no significant relationship to the occurrence worm disease in infants in flood prone areas Tamangapa Village Makassar. Research by Nusa et al, in line with this study that the habit of washing hands did not had a significant relationship with the occurrence of worm infestation. There were no association between habitual barefoot children with the incidence of intestinal worms, is in line with research Muchisah et al[18.19]. There was a relationship between the incidences of worm infestation and nail hygiene. This study was in line with research by Fitri et al and Marwah et al found no significant correlation between the cleanliness of nails with worm infection pupil primary school in the District Angkola East South Tapanuli.

CONCLUSION AND RECOMMENDATION

Major environmental health risks in flood-prone areas Tamangapa District of Manggala village of Makassar is RT 04 RW 06 with an index value of 229 environmental health risks and included in the very high risk category risk index 212-229. Meanwhile, RT 05 RW 04 with an index value of 155 environmental health risks is in the category of less risk with risk index 155-173. Nevertheless, children under five vulnerable to environmental based diseases in Makassar floods prone areas.

This research highly recommended that people living in the prone area have to be more concern with the hygiene and environmental health sanitation.

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Quality of Life among Older Adult Cancer Patients Undergoing Chemotherapy in the Tertiary Referral Hospital of Bangkok, Thailand

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ABSTRACT

Background: The incidence of cancer among the age group of 55 years and above was very high compared to other age groups and tends to rise with age. The quality of life is necessary for deploying on the predictions and forecasts in the lives of patients with cancer. This study aims to explore the quality of life (QOL) and its factors associated among older adult cancer patients undergoing chemotherapy in the tertiary referral hospital of Bangkok, Thailand. Method: A cross-sectional study was conducted at the outpatient chemotherapy centre of King Chulalongkorn Memorial hospital, Bangkok, Thailand. A total of 105 older adult cancer patients aged 55 years old and over diagnosed with colon cancer, lung cancer, and/or breast cancer and received the chemotherapy treatment were interviewed after obtaining the informed consent. A validated, reliable Functional Assessment of Cancer Therapy General (FACT-G) Thai version tool was used to measure the quality of life. The chi square test was performed to find association of the variable with QOL scores. Results: The mean score of the quality of life (total QOL) in the elderly participants was found 44.41±7.95 which was at the moderate level. There was no relationship between the QOL and variables such as age, gender, marital status, educational levels, occupation and chronic diseases. Furthermore, no correlation was found between QOL and the types of cancer and the pain levels among older adult cancer patients undergoing chemotherapy. Conclusion: The intervention and program to improve QOL should encourage to be organized in all hospitals including clinics, public or private hospitals and furthermore promoted among their patients along with the chemotherapy and regular treatment.

Keywords: *Quality of Life; Cancer Patient; Older Adult*

INTRODUCTION

Cancer is a leading cause of death with in top rate of the world. The overall incidence of cancer in Thailand is similar to the global population. The incidence rate and the risk of disease were also found to be increasing along with age. According to data from the National Cancer Institute in Thailand, it was found that more than 50% of all new cases of cancer were found in older adult whose aged group of 55 years and over, and 60% of deaths among this age group were from cancer. The incidence of cancer is increasing strongly and this obviously affects this population.[1] The most common cancer types found in men with age of 55 years old and over were liver cancer, lung cancer and colon cancer, and in women were breast cancer, colon cancer, and lung cancer.[2, 3, 4]

According to the fact that chemotherapy is a highly effective treatment for cancer patients, older adult cancer patients have been in the long treatment and repeated hospitalizations along with side effects of chemotherapy. The study of the past through the use of chemotherapy among cancer patients the elderly when compared with younger patients, the research found that elderly patients with cancer have more complications and unpleasant side effects from the chemotherapy than younger patients.[5] These can affect quality of life, which is important for the patients, especially in elderly patients because it influences to both physical and

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mental disabilities.[6] Consequently, it is very important to elderly patients, and it is necessary for hospitals to be deployed on the predictions and forecasts in the lives of patients with cancer by increasing the quality of life among these people along with the treatment. Since, it is more important than the patient survives because quality of life is important to realize as the basis for the treatment of cancer patients.

There is rarity on the study based on quality of life among older adult cancer patients undergoing chemotherapy in Thailand. This study has addressed the magnitude of the quality of life and its associated factors among older adult cancer patients by using Functional Assessment of Cancer Therapy General (FACT-G), which is useful in the planning of an appropriate on-going intervention for the efficiency of cancer care.[7]

MATERIAL AND METHOD

This was a cross-sectional study conducted by interviewing older adult cancer patients undergoing chemotherapy (aged 55 years old and over) who have been being out-patient (OPD case) with colorectal cancer, lung cancer and/or breast cancer at outpatient chemotherapy centre of King Chulalongkorn Memorial Hospital, Bangkok Thailand. Finally, 105 cancer patients participated in this study as per sample size calculated based on Cohen's (1998).[8] A validated and reliable tool (FACT-G) was adopted for this study through trained data collectors. FACT-G consists of 27 questions covering the domains of physical (Phy), social (Soc), psychology (Psy), and activity (Act) well-being. The overall rating of the quality of life in the range 0-108 points bringing the score to be divided into five levels by using the interpretation of the score which were extremely low, low, moderate, high, and very high. Data were analysed through descriptive statistics to characterize the samples and assess socio-demographic factors. The chi square test was performed to find association of the variable with QOL scores by using SPSS (version 16).

FINDINGS

The majority of patients (55.2%) were female, aged 55-83 years, with a mean age of 64.23±6.49, married (81.9%), and primary school graduates (46.7%), and 23.8 percent of respondents completed their Bachelor's degree & higher (Table-1). One fourth of the patients (25.7%) replied that they are currently unemployed. However, among the elderly were working as the government officer (21.9), merchant (12.4%), and contractor (11.4%), respectively. All of respondents were entitled to health insurances. Almost haft of them (43.8%) of them used nation coverage, and 22.9% was self-paid for the medical care. Most of the patients 89.5% have been suffering from chronic diseases which were hypertension, dyslipidaemia, diabetes, and heart disease. The mean of weight, blood pressure, and pulse were also shown in Table-1. There was no association between the QOL and variables such as age, gender, marital status, educational levels, occupation and chronic diseases among the cancer patients.

The quality of life of the elderly: The mean score of the quality of life (total QOL) in the elderly participants was found 44.41±7.95 which was at the moderate level. The findings of the mean score of the four domains were showed in table-2. The QOL was moderate in majority (55.2%) of the patients followed by low level (43.8%), and only 1% at the high level. Table-3 shows the relationship between cancer types and QOL. There was no association between cancer type and QOL among the cancer patients. Table-4 shows relationship between pain levels and QOL in older adult cancer patients undergoing chemotherapy. There was only 2% of the patients with mild pain. Patients with moderate pain level had better QOL than the others. However, chi square test showed that there was no significant relationship between the pain level and QOL in cancer patients undergoing chemotherapy.

Table-1: Socio-demographic characteristics

Variables	n	%
Age		
≤ 60	35	33.3
61-91	48	45.7
70-79	20	19.0
≥ 80	2	1.9
(Mean = 64.23, SD= 6.49, Min= 55, Max= 83)		
Gender		
Male	47	44.8
Female	58	55.2
Marital Status		
Married	86	81.9
Single	4	3.8
Separated/ Divorce	15	14.3
Education levels		
No education	3	2.9
Primary school	49	46.7

Cont... **Table-1: Socio-demographic characteristics**

Variables	n	%
Secondary	17	16.2
Diploma	11	10.5
Bachelor's degree & higher	25	23.8
Occupation		
No Occupation	27	25.7
Government	23	21.9
Merchant	13	12.4
Farmer	9	8.6
Contractor	12	11.4
Business	11	10.5
Other	10	9.5
Chronic diseases		
Yes	11	10.5
No	94	89.5
Weight (kg.)	(Mean±SD) 55.78±10.86	
Blood Pressure	(Mean±SD) 135.16±22.15	
Pulse	(Mean±SD) 83.37±13.46	

Table-2: Quality of life score and 4 domains among the older adult cancer patients (n=105)

QOL	Mean	SD.
Physical (Phy) well-being	9.22	3.32
Social (Soc) well-being	13.37	2.60
Psychology (Psy) well-being	9.86	2.49
Activity (Act) well-being	11.96	3.43
Total QOL	44.41	7.95

Table-3: Frequency of types of cancer regarding QOL among the older adult cancer patients (n=105)

Type of cancer	Quality of life			Sum
	Low	Moderate	High	
Colorectal Cancer	20 (19.0%)	24 (22.9%)	-	44 (41.9%)
Lung Cancer	12 (11.4%)	16 (15.2%)	1 (1%)	29 (27.6%)

Cont... **Table-3: Frequency of types of cancer regarding QOL among the older adult cancer patients (n=105)**

Type of cancer	Quality of life			Sum
	Low	Moderate	High	
Breast Cancer	14 (13.3%)	18 (17.1%)	-	32 (30.5%)
Total	**46 (43.8%)**	**58 (55.2%)**	**1 (1%)**	**105 (100%)**

Table-4: Frequency of pain levels regarding QOL among the older adult cancer patients (n=105)

Pain	Quality of life			Sum
	Low	Moderate	High	
Mild	1 (0.95%)	1 (0.95%)	-	2 (1.90%)
Moderate	26 (24.76%)	41 (39.05%)	1 (0.95%)	68 (64.76%)
Severe	19 (18.10%)	16 (15.24%)	-	35 (33.34%)
Total	**46 (43.81%)**	**58 (55.24%)**	**1 (0.95%)**	**105 (100%)**

DISCUSSION

Quality of life is the recognition of the status in life and the context of the culture and values that can expect not to be affected by a condition or disease treatment, which include physical, social/ family, emotional/ mental well-being, and happiness of activities.[7] It is very necessary to realize along with health status and the treatment among older adult cancer patients.

Functional Assessment of Cancer Therapy General Scale (FACT-G), has been recently validated in elderly cancer patients. FACT-G total score and sub scores were compared with the mixed aged cancer patients' normative group of Cella et al. (1993).[7] Authors' conclusions were that FACT-G proved to be a valid and reliable instrument, not biased by patients' age. FACT-G reveals four domains which are physical well-being (Phy) defined as the elderly cancer patients undergoing chemotherapy's own body perception, social/family well-being defined as the perception of care or support from family members who intimate with the patients, psychological well-being (Psy) recognized to the awareness of the elderly cancer patients receiving

chemotherapy in the illness, such as anxiety, and activity well-being (Act) in the practice of activities defined as the cancer patients undergoing chemotherapy's perception and efficacy of the ability to accept the illness.

This present study found that the quality of life among older adult cancer patients undergoing chemotherapy was at moderate level. The previous studies have supported the results and showed similarly in the quality of life among older adult cancer patients.[9] When considering each domain, physical well-being (Phy) and psychological well-being (Psy) was shown the lowest among the four sub scores. Not surprisingly, cancer itself and its treatment influence to both physical and mental disabilities. The previous studies had also supported this study and showed the similar results.[10,11,12,13] This suggests that non-pharmacological factors possibly play an important role in how patients experience or interpret physical symptoms during the treatment phase.[14,15]

The present study found that the QOL in all the types of cancer was reported almost equally at the low and moderate level. This findings showed similarly with the previous studies which found that lung cancer was associated with low QOL.[16] Lung cancer diagnosis and treatment often produce stress resulting from the actual symptoms of the disease. The results emphasized that elderly persons newly diagnosed with lung cancer are especially vulnerable and need special attention in clinical conditions to compensate for their grave situation in relation to QOL. For colorectal cancer, the previous study had also found that the QOL was worsen.[17]

In this study, the pain level among cancer patients found the most at the moderate pain. The quality of life was lower in the patients with severe pain compared to those had mild and moderate pain. This obviously relates to the signs and symptoms of the cancer and the treatment that affect to the QOL score. However, the findings of the present study show that there was no association between the QOL and variables such as age, gender, marital status, educational levels, occupation and chronic diseases among the cancer patients. Similar results have reported in other studies.[18,19] Further, there was no significant relationship between cancer type and QOL and between the pain level and QOL in cancer patients undergoing chemotherapy. This was consistent with the previous studies which indicated the similar results.[18]

CONCLUSION

The study has concluded that the QOL among older adult cancer patients undergoing chemotherapy was at the low and moderate level. Consequently, the intervention and program to improve QOL for both physical and psychological functioning should encourage to be organized in all hospitals including clinics, public or private hospitals and furthermore promoted among their patients along the regular treatment. Furthermore, home-based program also hold the promise in improving OQL among older adult cancer survivors for the long-lasting effects.

Ethical Clearance: Study was approved by the Ethics Review Committee for Research Involving Human Research Subjects, Research Affairs Faculty of Medicine, Chulalongkorn University, Thailand. Participants received both written and verbal information before they agreed to participate.

Conflict of Interests: This study have no conflicts of interest.

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Effectiveness of Dental Health Education Program Using Digital Aids in Dental Clinics

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ABSTRACT

Introduction: Health promotion improves the health of the population and promotes health capital. Use of teaching technology presents many challenges, but it achieves goals beyond the learning objectives of a single class and helps to support future public health activities.

Objectives: The present study was undertaken to evaluate and to compare the effectiveness of Dental Health Education program using digital aids with conventional methods in improving oral health knowledge, practices and oral health status of patients visiting dental clinics.

Methodology: This study utilized the "**Activated Health Education Model"**. 150no. individuals divided randomly into 2 groups of 75 each for conventional technique and digital technique. Pre-education questionnaire evaluated oral health knowledge, awareness and attitude from all the samples. Pre-education plaque index, DMFT and gingival scores were recorded. Education was conducted by digital and conventional methods. 3 months post education mean scores with standard deviation were tabulated for both conventional and digital education techniques. Statistical analysis of Variance was done using one way Anova test and conclusions were drawn.

Conclusion: Dental education has a definite role in improving patient knowledge, awareness regarding oral health. Digital education technique is similar to conventional education technique in health promotion .

Keywords: *Digital education technique, Activated Health Education Model, oral health*

INTRODUCTION

Health education is an important tool to improve health of populations and to promote health capital. Access to appropriate education tools, engaging people in effective health education practice, reaching people of remote and rural areas, time and cost involved in health education and effective and timely support from government are some of the challenges that exist. [1] Development in technology such as internet, multimedia patient education software, practice management software programs have helped dentists to improve delivery of health information for their patients, documentation, clinical practice in a big way. Hence it is necessary to include various technological aspects related to dentistry in the course curriculum at undergraduate and postgraduate training. This will prepare students to use this technology in practice, patient education and for research efficiently to give best to their patients and society .[2]

Communication in dentistry is very important to treat the patient effectively, to prevent legal hazels and promote health in population. Patient education

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has done by clinicians through drawing pictures, using models, or pointing out pathology on a radiograph using their communication skills. But not every dentist is an effective communicator, and this can create a serious problem in patient management, treatment planning and outcomes. Patients access healthcare information, not only through health professionals but also through books, pamphlets, newspaper, television and internet that make the learning process easier. Patient education software in multimedia presentation deliver messages comprehensively to help the patients to understand the available treatment and possible complications..[3, 4]

Even though internet is a very vast and a great source of digital information, it may create confusions among patients regarding decision making. Hence it is important that dentists reinforce their timely and appropriate recommendations by case based learning instead of incorporating all the information available in the internet. Health education's greatest focus is concentrated on intrapersonal capacity, *i.e.* individual characteristics that influence behavior, such as knowledge, attitudes, beliefs and personality traits and interpersonal supports such as family, friends and peers that provide social identity, support and role definition.

Hence present study was undertaken to evaluate and compare the effectiveness of Dental Health Education program using digital aids with conventional methods in improving oral health knowledge, practices and oral health status of patients visiting dental clinics.

Objectives of the study were

1. To assess the oral health status of the patients as a baseline data.

2. To assess and compare the digital aids and conventional methods in patient education to improve the knowledge and practices of patients using structured questionnaire.

3. To compare the above 2 groups for retention of knowledge and improved practices after the cessation of program at 3 months interval by clinical recording for oral health status and using questionnaire.

METHODOLOGY

This randomized controlled trial will utilize the "**Activated Health Education Model"**[1] having three-phases that actively engages individuals in the assessment of their health (experiential phase); presents information and creates awareness of the target behavior (awareness phase); and facilitates its identification and clarification of personal health values and develops a customized plan for behavior change (responsibility phase).This model assumes that phase one precedes the other phases and the phase two will decrease in emphasis as phase three increases in emphasis. Adult patients in the age group of 35-44years (WHO Index age groups) who are visiting to dental clinics were randomized into control and experimental groups using lottery method. Medically compromised patients, differently abled patients were excluded from the study. Clinical examination recording was done using Plaque Index, Gingival Index and DMFT (WHO Modification). A validated questionnaire was used to assess the knowledge and practices of the patients.

Sample size for the study was taken as 150 (according to the Altman's nomogram used to calculate sample size, taking power of the test as 0.85 and standardized difference as 0.30).Intra calibration of the investigator to educate the study subjects will be done to ensure reliability. Reliability of the questionnaire will be measured by administering the questionnaire to 10 individuals.

Data Collection: Ethical clearance to conduct the study will be obtained from the Institutional Ethics Committee.

Methodology of data collection is depicted in Table 1

I Phase: Data was collected by face to face interview using an interview schedule. An oral examination was conducted and the findings was recorded. Oral health assessment was carried out by employing the Plaque Index (Silness and Loe,1963), Gingival Index (Loe and Silness,1963)and DMFT (WHO modification 1987). Elaborate case history, oral examination and various diagnostic tools such as pulp sensibility tests, radiographs will be taken to identify the oral conditions.

II Phase: A questionnaire was given to the patient to assess his knowledge about his present oral conditions and prevention strategies. Answers to questions were given later for creating awareness about their oral conditions and prevention of aggravation of conditions.

III Phase: Health education was given using

conventional models (drawings, pictures, models, charts)and digital technology(images of oral conditions on i-pad, Introaral camera, radiographs on RVG, Power points projections using LCDs) for control and experimental group. Post education questionnaire was given to the patient to evaluate their self -management strategies after 3 months.

Table 1. Showing the methodology of data collection

Case group	Control group
History and base line examination for oral health and gingival health	History and base line examination for oral health and gingival health
Oral health examination (OHE) questionnaire	Oral health examination (OHE) questionnaire
Oral health education using digital aids	Oral health education using conventional methods
Follow up at 3 months with questionnaire and OHE	Follow up at 3 months with questionnaire and OHE
Outcome assessment by using Indices	Outcome assessment by using Indices

RESULTS

A total no. of 150 individuals divided randomly into 2 groups of 75 each for conventional technique and digital technique respectively. Pre and 3 months post education mean scores with standard deviation were tabulated for both conventional and digital education techniques in Table 2.

Post education mean score of oral health knowledge was improved to 55±9 from 35±7 (Pre-education score) in case of conventional education technique. Similarly as in case of digital technique mean score improved from 34±5 to post education 58±8. Improvement in the Oral Health Knowledge was found to be statistically significant by showing improvement in the post education scores when compared to pre-education scores in both the conventional and digital techniques, with no statistical difference between digital and conventional techniques. Results were same for Oral health practices, Filled components and Gingival status.(Table 2).

Table 2. Pre & post education oral health knowledge, oral health practice and oral health status scores

	Conventional		Digital	
	Pre	Post(3 months)	Pre	Post (3Months)
Oral health knowledge	35±7	55±9	34±5	58±8
P value	0.02		0.03	
Oral health practices	34(45.3%)	50(66.6%)	36(47.3%)	58(73.3%)
P value	0.05		0.05	
Filled components	34(45.3%)	20(58.8%)	30(40%)	25(83.3%)
P value	0.16		0.19	
Gingival status	2.1±0.09	1.8±0.8	2.3±0.9	1.5±0.9
P value	0.09		0.04	

Post education comparison between conventional and digital education methods after 3 months showed no statistical significant difference between conventional and digital techniques for oral health knowledge, oral health practices and gingival status. But filled components were better in digital education technique than conventional technique with statistically significant difference.(Table 3)

Table 3: Post education comparison between conventional and digital education methods after 3 months

	Conventional	Digital	P value
Oral health knowledge	55±9	58±8	0.06
Oral health practices	50(66.6%)	58(73.3%)	0.12
Filled components	20(58.8%)	25(83.3%)	0.04
Gingival status	1.8±0.8	1.5±0.9	0.08

After 3 months it was found that there is a definitive improvement in all the scores for both the education techniques with no statistical difference between the groups.(Table 1)

Hence the from the collected data it can be concluded that both conventional and digital education technique are very useful in improving Oral health knowledge, Oral health practices ,Filled components and Gingival status. But there is no statistically significant difference between conventional technique and digital technique.

DISCUSSION

Activated Health Education Model used in this study is easy to follow and evaluate the learning process, which facilitates identification and clarification of personal health values and develops a customized plan for behavior change. [1]

Results showed that 3 months follow up was statistically significant improvement compared to baseline data in both digital and conventional education groups regarding oral health knowledge, oral health practices, filled components and gingival status.(Table 1) Similar results were obtained by Worthington HV et.al [6] in a Cluster Randomized Controlled Trial of a Dental Health Education Program for 10-year-old children and also Tolvanen M et.al.in 2009 [7]. This shows patient education has an important role in improving oral health-related behavior, knowledge and attitudes in population.

There was no statistically significant difference between when digital technique and conventional education technique.(Table 2) This shows digital aids have similar advantages as conventional technique in oral health education. Contrary to our study, Fernandez JB, et.al on the of mobile electronic devices as educational tool in pediatric community outreach concluded that the shift from using paper forms to electronic media had a positive impact among the academic community, saved time and reduced data collection errors. Hence,it provides an opportunity to enhance research and quality assessment.[8]

Results obtained by Mahesh Ahireet al. in their randomized control study on the effectiveness of dental health education on brushing technique using Robotutor, clinician and audio-visual aid , the best mode of education was clinician demonstration and the least effective one was the audio-video mode, which is also similar to our study.[9] If dentist's communication skills are good even the conventional techniques will have similar role in patient education. Emier B.F. et al. [10] found that repetition and reinforcement accounted for significant improvement in oral hygiene.[10] In the present study education was given once, no repetition was done. Further studies have to be conducted to evaluate the efficacy by repetition and reinforcement of oral health education.

Rozier RG *et al* [11]Amuh *et al* [12] and Mayeaux EJ *et. al* [13] stressed on good communication skills to ensure that education is effective and suggested to include dentistry in the curricular of medical school with more emphasis [12] and also found that physicians who speak in simpler language, repeat their instructions and demonstrate key points, enhance their patients' understanding[13]. To be effective with patients whose literacy skills are low, patient education materials should be short and simple. Compliance with therapy also may be improved by including family members in the patient education process.[13]This could be the reason for the present study not to have better results with digital education technique since our samples were not very well educated.

Further studies are required to evaluate the correlation between the dentists'communication skills and outcome of patient education and efficacy of repetition and reinforcement of dental education in the

improvement of patients' oral hygiene.

CONCLUSIONS

From the results of the present study, it can be concluded that

Patient education has a definite role in improving patients' knowledge and awareness on oral health and improves the oral health practices.

Digital education aids are as advantageous as conventional aids in patient education.

3 Months post education knowledge, awareness and practices of oral health improved significantly.

Ethical Clearance: Obtained from: Institutional ethics committee, MCODS, Mangalore

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Conflict of Interest: NIL

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A Correlation Analysis of Attitude, Subjective Norm and Behavioral Control Toward the Intention of Safety Behavior

(A Study on Plate Cutting Workers of Commercial Ships Division PT. PAL Indonesia (Persero)

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ABSTRACT

PT. PAL is one of industry with a high risk of accidents. Workers cutting plate is examined in this study consisted of workers marking, cutting and fitter in the workshop Assembly, fabrication, CBL, MPL and workshops HO/ AO. Behavioral Intention survived in this research study is based on the Theory of Planned Behavior.

The purpose of this study was to analyze the relationship of attitudes, subjective norms and behavioral control to the intention of behave safely on a plate cutting workers in the Division of Commercial Ships PT. PAL Indonesia (Persero). This research is an observational research with cross sectional design. This research was held in March-April, 2017, with a population of 37 people and the sample was 34 obtained through the calculation formula of simple random sampling. Data is collected using a questionnaire.

Result based on the Spearman rho correlation test showed that there is no relationship between attitudes toward the intention of safety behavior (p = 0.86), there is no relationship between subjective norms toward the intention of safety behavior (p = 0.09) and there is a relationship between behavioral control toward the intentions of safety behavior (p = 0.02).

Keywords: *safety behavior, attitudes, subjective norms, behavioral control, intention*

INTRODUCTION

Safety behavior is part of the risk management process as the cause of accidents. Health and safety at work has centered on control of the working environment and the physical working procedures of employees in an effort to prevent errors and accidents, human factors that contribute to violence and accidents[1]. Human error is the most important factor as the cause of accidents that can eliminate human lives, injuries to workers and facility damage[2]. Workers represent half the world's population and is a major contributor to economic development and sosial[3]. Around 960,000 workers were injured in an industrial accident every 24 hours with 5,330 fatalities due to occupational disease[4].

Health and Safety should be a shared responsibility between companies, management and employees. They must have the skills to identify and describe the relationship between the work environments, organization, productivity and health[5]. Shipbuilding is one of the very complex construction, where there are many types of work to be done in parallel. The process and the handling of steel requires extensive facilities and a good place for the construction of ships, storage of materials and equipment in the production process. Steel is not only accepted, inspected, sorted, stored but must also be in blasting, cutting and forming according to desain[6].

PT. PAL Indonesia (Persero), has the main tasks, one of which is the production of ship. On this ship production process conducted by using technology equipment and the process is at high risk, as shown by the high incidence of accidents in the shipbuilding. Type of accident is the case of exposed grams, exposed to radiation filter, cut, scratched, pinched, hit, splash welding and burning. Workers of cutting plate examined in this study consisted of marking, cutting and fitter

workers in the workshop Assembly, fabrication, CBL, MPL and HO/ AO workshop. Cutting plate job is a work that has high potential hazards in accordance with the equipment used and the workmanship, based on the observation of the potential danger to the cutting plate is a gas leak oxygen, a gas leak acetylene, fire/ exploding, eye irritation, dizziness, workers exposed to heat / sparks fire, workers pinched/ etched plate, exposed grams, respiratory problems and others.

The interview with the head of the workshop said that the withholding of ship plate has three (3) types, they are manual, automatic and semi-Automatic. Manual cutting consists of marking which is making a pattern on ship plate and Cutting which is done by using a tool such as angled ruler, sipatan, scator, and Rell Scator, brander by using acetylene and oxygen. Automatic cutting machine done by using plasma Cutting by using nitrogen and Sapro machine which uses argon, oxygen and compressors. Therefore, the semi-automatic cutting is a combination of manual and automated cutting.

Personal protective equipment (PPE) used for cutting plates, namely helmets, work shoes, masks, goggles, leather gloves and work clothes. The results of observations of plate cutting workers found that some workers were not wearing protective equipment (PPE), based on interviews of workers reason is because it is already familiar with the job and do not have health problems or severe injury. Results of interviews with officer safety in the field say that the personal protective equipment provided by the company. Before starting the work of the workers, especially workers were given safety induction plate cutting and received briefings on cutting labor standards aim is for workers to know the rules K3 in the workplace and also understand the working standard plate cutting, so avoid the Unsafe action.

Applying safety behavior in the workplace for workers, it is necessary to identify the underlying factors that can cause the safety behavior of the workers. Theory of Planned Behavior is a behavioral method developed by Ajzen, where this method is applied to understand how individuals behave. The decision in the act is the result of a reasoned process where behavior is influenced by attitudes, subjective norms and Perceived Behavioral Control, it affects mainly the behavior intention. The relationship between intention and behavior can be described as "People do what they intend to do and do not do what they do not intend" [7].

This study aimed to analyze the relationship between attitudes, subjective norms and behavioral control toward the intention to behave safely on a plate cutting workers in the Division of Commercial Ships PT. PAL Indonesia (Persero).

MATERIAL AND METHOD

This research is an observational research with cross sectional design. This study was conducted in March-April 2017, the population of this research was plate cutting workers in the Division of Commercial Ship of PT. PAL Indonesia Persero, total of 37 workers and the sample was 34 obtained through the calculation formula of simple random sampling. Data is collected by using questionnaires, researchers conducted an analysis of the results of the questionnaire with the Theory of Planned Behavior (TPB).

FINDING

Characteristics of research subjects in this study can be described in Table 1 below:

Table 1: Subject's characteristics

Characteristics	Category	Amount	%
Age	20-30 years	16	47.1%
	30-40 years	8	23.5%
	> 40 years	10	29.4%
	Total	34	100%
Years of service	1-15 years	23	67.6%
	16-30 years	10	29.4%
	> 30 years	1	2.9%
	Total	34	100%
Education	SMA / SMK	31	91.2%
	PT	3	8.8%
	Total	34	100%
Employment status	organic	17	50.0%
	PKWT	17	50.0%
	Total	34	100%
Knowledge of Occupational Health and Safety	Less	0	0.0%
	Enough	4	11.8%
	Good	30	88.2%
	Total	34	100%

(Source: Cutting Plate Workers of Commercial Ship Division, 2017)

The data collection of characteristics of the subject in this research was conducted by questionnaire including age, years of education, employment status and knowledge of Occupational Health and Safety. Most workers age is between 20-30 years were 47.1%. Most work period is 1-15 years is 67.6%. The level of education is high school most of the workers as much as 31 workers (91.2%). 17 workers (50.0%) are permanent workers and 17 workers (50.0%) non-permanent employees. Workers knowledge level of the Safety Behavior on the cutting plate is a good category (88.2%) of 30 respondents.

The results of data collection is based on a questionnaire on attitudes, subjective norms, behavior control toward intention of behaving safely on a plate cutting workers. The results of data processing questionnaire shown in the following tables:

Table 2: The correlation of Attitudes toward the intension of Safety Behavior of Plate Cutting Workers of Commercial Ship Division PT. PAL Indonesia (Persero)

Attitude	Intention of Safety Behavior					
	Less		Enough		Good	
	N	%	N	%	N	%
less	2	66.7	0	0	1	33.3
Enough	4	23.5	4	23.5	9	52.9
Good	5	35.7	2	14.3	7	50.0
p-value	**0,86**					

(α=0,05)

Table 2 shows that the attitude of the less showed a lack of intention to behave safely, good attitude showed good intentions to behave safely.The attitude in this study is the response, response or reaction tendency of employment to a number of questions about specific behaviors that are positive or negative is usually manifested in the form of liking or dislike, agree or disagree. Relations attitude to the intention of behaving safely plate cutting workers in the merchant vessel division PT. PAL Indonesia (Persero) is not significant, it is supported by research Uryan (2010)[8] attitude refers to an individual feeling about something, which is evaluated and generalized according to the individual's personality, Weak employee attitudes toward intention to behave based on health and safety at work (K3) because many factors influence a person's attitude is a personal experience, culture, mass media, institutions (companies) and emotional factors[9]. When an individual decides to behave safely, formation of intention will be influenced by personal factors and influences sosial[10]. The attitude sometimes fail to be a behavior because many other factors that prevent people change their attitude to the behavior[1].

Table 3: The correlation of subjective norm toward the intension of safety behavior of Plate cutting workers of Commercial Ship Division PT. PAL Indonesia (Persero)

Subjective Norms	Intention of Safety Behavior					
	Less		Enough		Good	
	N	%	N	%	N	%
Less	10	43.5	3	13.0	10	43.5
Enough	1	50.0	0	0	1	50.0
Good	0	0	3	33.3	6	66.7
p-value	0,09					

(α=0,05)

Table 3 shows that the correlation of subjective norm to behave safely intention is not significant. Subjective norm in question in this research is the perception felt by workers in the workplace in particular safety concerns and influence the behavior of fellow workers survived on worker attitudes and intentions to behave safely. Safety culture of an organization formed beliefs, values, and behaviors of individuals (Helmreich and Merritt, 2001)[11]. Subjective norm is a person's perception regarding the Agreement others against an action, what other people important want to do or what they will approve or disapprove, can establish normative beliefs descriptive based on the actions observed or inferred from others (Ajzen, 2015)[12]. If others are relevant view that displays

the behavior as something positive and the person is motivated to fulfill the expectations of others that are relevant, then it is called with a positive subjective norm. If the behavior shown is that negative behavior called the negative subjective norms (Ba'agil, 2012)[13]. Subjective norm refers to the individual's perception of social pressure to perform or not perform the behavior. This means that if a person feels that people who are important to him approve or disapprove of the behavior, individuals are more inclined or do not want to do it (Denan et al, 2015)[14].

Table 4: The correlation of behavioral Control toward the intension of safety behavior of plate Cutting workers of Commercial Ship Division of PT. PAL Indonesia (Persero)

Control Behavior	Intention of Safety behavior					
	Less		Enough		Good	
	N	%	N	%	N	%
Less	9	47.4	4	21.1	6	31.6
Enough	1	14.3	0	0	6	85.7
Good	1	12.5	2	25.0	5	62.5
p-value	**0,02**					

(α=0,05)

Table 4 shows that there is a significant relationship between behavioral control and intention to behave safely. Controls showed less behavior intention less about behaving safely, control the behavior that demonstrates both good intention of behaving safely. This means that the value of the intention of behaving safely increases with behavioral control. Behavior control as measured in this study are Perception of workers about the things around it that hinder or support the behavior of survivors. Ajzen (2005)[15] also states that the Control Belief leads to the perception that an individual has or does not have the ability to display a behavior. If someone has a powerful Control Beliefs regarding an existing factors will facilitate a behavior, then a person has a high perception to be able to control behavior. Instead, someone would have a low perception in controlling a behavior if he has a weak Control Beliefs about the various factors that inhibit behavior. The role of behavioral control plays an important role in the theory of planned behavior, perceived behavioral control refers to people's perception of ease or difficulty performing the behavior (Ajzen, 1991)[16].

CONCLUSION

There is no correlation between attitude towards the intention of safety behavior of Worker of Cutting Plate of Commercial Ships Division PT. PAL Indonesia (Persero)

There is no correlation between subjective norms toward the intention of safety behavior of Worker of Cutting Plate of Commercial Ships Division PT. PAL Indonesia (Persero)

There is a correlation between behavioral control toward the intention of safety behavior of Worker of Cutting Plate of Commercial Ships Division PT. PAL Indonesia (Persero)

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Ethical Clearance: The study was approved by the institutional Etichal Board of Public Health, Airlangga University.

All subjects were fully informed about the procedures and objectives of this study and each subject prior to the study signed an informed consent form.

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An Analysis of Factors Associated with the Safety Behavior of Ship Inspection Employees Safety in Port Health Office Class I Surabaya

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ABSTRACT

Occupational accident is an unexpected and unplanned occurrence, including acts of violence, arising out of or in connection with work which results in one or more workers incurring a personal injury, disease or death. Based on several studies, unsafe behavior is one of the major causes of occupational accident (80%). There are two (2) main factors that influence a person's behavior, ie internal factors and external factors. Ship inspection work has risk for great danger, enough to cause death. Approach to safety behavioral is an effort for the employees of ships inspection to avoid the risk or potential danger while doing inspection of ships. This study aimed to analyze the internal factors and external factors related to the safety behavior during the inspection of the ship. The variable of internal factors includes gender, age, education level, employment status, working period, safety and health knowledge, skill and the intention to carry out safety behavior. The variable of external factors includes the training of K3, the availability of PPE, the availability of labor and materials, nearmiss history, safety and health policy, and sanctions. This study was an observational study with cross sectional approach. This study was conducted in the Port Health Office Class I Surabaya. The population of this study were employees of ship inspection, 36 people with the sampling technique by using accidental sampling for 1 (one) month with a sample size of 25 people. Based on the research for the internal factors, obtained three variables which have a relationship with the safety behavior, they are gender (p-value=0.021, r= 0.419), skill (p-value=0.004, r= 0.557) and intentions (p-value=0.009, r=0.464). There are two variables in the external factors which have a relationship with the safety behavior, the variable of availability of PPE (p-value=0.002, r=0.535) and the variable of availability of tools and materials (p-value=0.002, r=0.535). Results based on Logistic regression analysis showed that intention is the only variable which is associated to the safety behavior (R-square=0.512 and Exp (B)=19). It is recommended to the Port Health Office Class I Surabaya to conduct PPE training, increased the supervision of safety behavior, and develop systems for recording and reporting occupational accident and nearmiss.

Keywords: *ship inspector, safety behavior*

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INTRODUCTION

Accident is an unplanned events that may cause loss of material and non-material. International Labor Organization/ ILO (2012) noted the occurrence of occupational accidents globally reached 337 million cases of work accidents per year and some 2.3 million people died. The average number of accidents in Indonesia reached 99,000 per year, 70% resulted in

death and/ or permanent disability, loss of 4% of the total Gross Domestic Product/GDP of the nation.

Workplace accidents do not happen by chance, but there are the causes[1]. According to the domino theory advanced by Heinrich (1950) that the cause of the accident to workers caused by five (5) main factors that relate to each other. Frank Bird Jr. and Germain (1986) modify the theory of Domino Heinrich who says that there are five (5) factors causing the loss, namely 1) lack of control, 2) the basic causes, 3) the immediate causes, 4) occupational accidents (incidences), 5) the impact of losses[2].

Research conducted by the National Safety Council/ NSC states that 88% of causes of accidents are the unsafe action, 10% were caused by unsafe condition, and 2% did not know the cause. Institute of Occupational Safety and Health/IOSH (2012) states that 73% of workplace accidents due to unsafe action and 24% are caused by the environment or equipment that do not qualify. According to some studies, 85-90% of workplace accidents that occurred were caused by unsafe condition[3], so it is necessary efforts with behavioral approach safely to prevent accidents.

According to Notoatmodjo (2010) that the person's behavior can be influenced by two factors, namely internal and eksternal factors[4]. Internal factors which influence the behavior of workers such as knowledge, attitude, age, tenure, and gender. External factors that influence the behavior of workers, among others, the organization's policies, labor standards, facilities, and supervision.

Port Health Office Class I Surabaya is a technical implementation unit of the Ministry of Health has the main task and function in the quarantine. One of the main tasks that must be done quarantine of inspection of the vessel is a lean and/ or anchored, whether that comes from within and from outside the country. Examining the ship assigned to perform the vessel sanitation inspection, risk factor screening and health checks Ship's Men (ABK) and completeness of first aids on board.

Ship inspection employee does not escape from the risks that may occur during the inspection of ships. Risks or potential occupational hazards inspection of the vessel among others slipped while up and down the stairs, fell into the sea, wedged between the hull, traffic accidents, and death. Until the end of 2016 in Class I Port Health Office in Surabaya found nooccupational Accidents happen, but some ships have experienced ship inspection employee perform near miss, among other things slip, work wear caught and banged to the ship's body[5]. In July 2015, an employee examiner occupational accident of the Port Health Office in Batulicin to cause death[6].

Unsafe behavior is one of the highest causes of occupational accident, necessitating an effort approach to safe behavior in order to avoid occupational accident and/or near misses. To foster safe behavior on the ship examiner employee then you need to know what factors can affect safe behavior so that strategies to foster safe behavior can be run as intended.

MATERIAL AND METHOD

This study was an observational study with cross sectional approach. The total sample of 25 employees of ship inspection. Sampling done by using accidental sampling technique for 1 month. The research located in the Port Health Office Class I Surabaya conducted in January-June 2017.

The researchers did interview by using a questionnaire to obtain data on internal factors (gender, age, education level, employment status, working period, safety and health knowledge, skill and intentions to do safety behavior) and external factors (training of safety and health, availability of PPE, the availability of tools and materials work, history nearmiss, policy, and sanctions). Researchers conducted observations by using a check list to obtain data on safety behavior in the inspection of ships. The bivariate analysis was done by using contingency coefficient test. Multivariate analysis was done by using logistic regression.

FINDING

Internal factors ship inspection employees of Port Health Office Class I Surabaya can be seen in Table 1 as follows:

Table 1. Internal Factors Respondents

Internal factors	Category	n (%)
Gender	Man	14 (56)
	woman	11 (44)
Age (years)	21-30	9 (36)
	31-40	8 (24)
	> 40	8 (24)

Cont... **Table 1. Internal Factors Respondents**

Education	Dip. III (D3)	10 (40)
	Bachelor	15 (60)
Employment status	PNS	16 (64)
	Non PNS	9 (36)
Working period	<6 years	10 (40)
	≥6 years	15 (60)
Knowledge	Enough	10 (40)
	Good	15 (60)
Skill	Less	1 (4)
	capable	24 (96)
Intention	Enough	7 (28)
	Good	18 (72)

According to table 1 that respondents most male sex, age over 30 years, educated D3, status as civil servants, have a working period ≥6 years, have a good safety and health knowledge, skill capable and good intentions.

Works inspection of the vessel is a field job that requires a strong physical having to do up and down the ship with the facilities available. In addition, the ship inspection work also requires the ability to see something in detail to examine documents and vessel sanitation inspection. Psychologically, male workers have a stronger physically, but working women have a greater ability to do the detail work as compared to men.

Employee of ship inspection included in a young adult with a long working life. Working lives long enough cause workers to have more experience and understand the conditions of the working environment so that work more carefuly. Competent education level and years of long lead investigator employees have skill vessel capable of doing the job inspection of ships.

Most respondents have a good intention to perform the behavior in the safety inspection of ships. According to Schiffman and Kanuk (2007) states that the intention is related to the tendency of a person to act or do behave. Ajzen (2005) states that the intention is an indication of how strong the belief someone to try a behavior and how much effort will be used to perform the behavior[7].

According to Fishbein and Ajzen (1975) that the intention has four aspects, namely: (1) the target, the target to be achieved if they display a behavior; (2) action, ie an action that accompanies the advent of behavior; (3) context, which refers to a situation that will bring the behavior; and (4) time, the time of occurrence of the behavior, which includes a certain time in an unlimited period. According to the Theory of Planned Behavioral, intention is the most powerful predictor for the emergence of behavior[8].

Based on Table 2 that most respondents have never received training K3, the availability of sufficient PPE, the availability of tools and materials sufficient working, never experienced a near miss, perceive safety and health enough and have a good perception of sanctions.

Improved knowledge workers will increase understanding of the condition and the existing risks in the workplace. Knowledge workers can be obtained from the training and work experience. According Suma`mur (1979) that training is an effort to prevent accidents due to work[9]. Although most employees have not received training ship inspectors, but employees of ship inspectors have sufficient experience working for a fairly long period. Availability of APD and the availability of tools and materials sufficient working signifies low barrier to doing inspection of ships.

Table 2. Respondents External Factors

External factors	**Category**	**n (%)**
Safety and health training	Yes	9 (36)
	No	16 (64)
Availability of PPE	Less	6 (24)
	Enough	19 (76)
The availability of tools and working materials	Less	6 (24)
	Enough	19 (76)
A history of near misses	Ever	8 (32)
	Never	17 (68)
Policy of Safety and health	Enough	16 (64)
	Good	9 (36)
Sanctions	Enough	8 (32)
	Good	17 (68)

Although most respondents have never experienced nearmiss, but there are some respondents who had experienced it. Nearmiss in the inspection of ships is an event in the works. According Priyoto (2014) in Andriana (2016) explains that the event is one form of

cues for a person to act or do behave[10].

Respondents perceive enough about safety and health policy and a good perception of sanctions. According Notoatmodjo (2010) that the organization's policies, including the policy, is one of the factors that influence a person's behavior. The policy is embodied in the rule, including sanctions load[11].

Table 3. Safety Behavior in Ship Inspection

Safety behavior	n	(%)
Enough	11	44
Good	14	56

Based on Table 3 note that most respondents have safety behavior in good categories. Aspects of safety behavior in the inspection of the ship consists of employee behavior examiner ship in terms of rise/drop ship safely with the equipment/facilities, use of PPE are complete and correct, inspection of the vessel in accordance with the authority, not smoking at the time of inspection of the vessel, and no kidding when the inspection of ships. Type of PPE in the inspection of ships, among others, safety helmets, safety shoes, N95 masks, goggles, vest, and gloves.

According to the theory of the behavior of the ABC model (Antecedent-Behavior-Cosequance) that the emergence of a behavior in a person caused by the triggering factor (antecedent). Antecendent important to bring up a behavior, but the effect is not sufficient to make such behavior last forever. Maintaining the required behavior in the long term significant consequences for individual[12].

Table 4. Relationship with Dependent Variables Independent Variables

Variables	safety Behavior	
	p-value	correlation value
Internal factors		
Gender	0.021	0.419
Age (years)	0.398	0.325
Education	0.253	0.362
Employment status	0.973	0.007
Years of service	0.343	0.302

Cont... **Table 4. Relationship with Dependent Variables Independent Variables**

Knowledge	0.622	0.098
Skill	0.004	0.557
Intention	0.009	0.464
External factors		
Safety and health training	0.973	0.007
Availability of PPE	0.002	0.535
The availability of tools and working materials	0.002	0.535
A history of near misses	0.653	0.089
Policy of Safety and health	0.495	0.135
Sanctions	0.383	0.172

Based on table 4 is known that there are three internal variables related to safety behavior because it has a significance value of <0.05. The internal variables are gender, skill inspection of the vessel, and the intention to carry out safety behavior. While external variables related to safety behavior is the availability of PPE and the availability of labor and materials.

Research conducted by Yuliana (2016) on inpatient nurse at a hospital in Surabaya showed that the gender factor has a strong enough relationship with submissive behavior using PPE[13]. Research conducted by Reino (2014) on sandblasting workers at PT X is known that there is no relationship between knowledge and PPE safety behavior training in the use of PPE[14].

Research conducted by Verlin and Gary (2014) at 180 food industry workers in the United States stated that there is a relationship between the intention to perform the behavior of the security-related food behavior[15]. From these studies also revealed that the intention to perform the behavior is also associated with the attitude, subjective norm, and perceived behavioral control. Another study conducted by Atombo et.al (2016) at 354 drivers in Ghana stated that there is a relationship between the intentions to drive a car safely with the car driving behavior safely[16].

Research conducted by Wong and Lee (2015) in 341 steel workers in Singapore made up of workers from Bangladesh, India, Myanmar, Malaysia, Thailand,

and China stating that there is a relationship between the intention to follow the rules of safety with attitude, perceived behavioral control, and subjective norms[17].

Variable availability of PPE (r=0535) and the availability of labor and materials (r=0535) also have a strong enough relationship with the safety behavior in the inspection of ships. Availability of PPE and the availability of labor and materials is a facility provided by the management. According Notoatmodjo, the facility is one of the external factors that can affect a person's behavior. According to the Standard Operating Procedures Vessel Traffic Supervision issued by the Ministry of Health that the PPE and equipment and working materials is an aspect that must be met for ship inspection job can run well.

Table 5. Logistic Regression Test Results

variables	B	Sig	Exp (B)
Intention	-2.974	0.035	0.051
constants	2.424	0.028	11.296

Results Logistic regression analysis showed that only the intention of doing safety behavior variables that have an influence on safety behavior in the inspection of the vessel.

Rated R square for the logistics test is 0.512, the value can be interpreted that the intention variables are able to explain the variation in the variable safety behavior in conducting inspection of the vessel by 51.2%, the remaining 48.8% of the variation is explained by other variation.

Safety and Health training needs to be done to boost the knowledge for employees of ship inspectors. Recording and reporting of near miss events and/or occupational accidents also needs to be done. Monitoring and evaluation of the use of a complete and correct PPE is also necessary to determine the extent to which the effectiveness of risk or potential danger to employees of ship inspectors.

CONCLUSION

Internal factor, there is a relationship between gender, skill and intention to perform safety behavior with the safety behavior in the inspection of ships.

External factors, there is a relationship between the availability of APD and the availability of tools and materials to work with safety behavior in the inspection of ships.

Only the intention of doing safety behavior variables that have an influence on safety behavior in the inspection of the vessel (R-square=0.512).

Conflict of Interest: None

Source of Funding: Department of Occupational Health and Safety, Airlangga University, Surabaya, Indonesia

Ethical Clearance: The study was approved by the ethical committee of Airlangga University, Surabaya, Indonesia

All subjects were fully informed about the procedures and objectives of this study and each subject prior to the study signed an informed consent form.

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Outcome of Oligohydramnios in Pregnant Women with Full Term Gestation

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ABSTRACT

Oligohydramnios is defined as AFI less than 5cm. The incidence of oligohydramnios varies between 1-5%. The incidence increases in post-dated pregnancies, noted in as many as 11%. The purpose of the study is to find out the causes for oligohydramnios and assess the perinatal morbidity and mortality associated with it. This is a prospective study of 100 pregnant women (50 cases of oligohydramnios and 50 cases with normal AFI) taking regular check-ups at hospitals attached to J.J.M. Medical College, Davangere. The selected patients were subjected to a detailed history, complete general physical examination and an ultrasound examination

Incidence of oligohydramnios was 1.48%. The common etiological factors for oligohydramnios were pre-eclampsia (16%), post-dated pregnancy (52%) and idiopathic (32%). Caesarean delivery rate was 70% out of which 45% were done as an elective procedure. The perinatal outcome was better in the caesareandeliveries done as elective procedures when compared with the emergency caesarean deliveries. Perinatal mortality was 18% and take home baby rate was 82%.

Oligohydramnios in course of pregnancy signals danger to the foetus. AFI ≤5 cm is associated with high incidence of thick meconium stained liquor, fetal distress, operative delivery and caesarean section, poor Apgar scores, low birth weight, meconium aspiration and perinatal morbidity and mortality.

Keywords*: Oligohydramnios; AFI assessment; perinatal outcome.*

INTRODUCTION

Oligohydramnios is defined as amniotic fluid index (AFI) ≤ 5cm as suggested by Phelan et al,[1] as an arbitrary cut off value, in 1987. Based on ultrasound findings, oligohydramnios is also defined as when the largest pocket of amniotic fluid in its largest diameter, measures less than 2cm in both horizontal and vertical planes.[2,3] Its incidence varies from 1-5% pregnancies at term. The incidence increases in post-dated pregnancies, noted in as many as 11%.[4] Decreased amniotic fluid is associated with an increased frequency of maternal and fetal complications.

The complications associated with oligohydramnios are: Fetal complications - Intrauterine growth restriction, Congenital anomalies, Cord compression and in turn fetal distress, Fetal pulmonary hypoplasia, Meconium, stained amniotic fluid leading to meconium aspiration syndrome, Fetal and neonatal acidosis, Deformity due to intra-amniotic adhesions or due to compression - Alteration in the shape of the skull; Wry neck; Club foot / amputation of limb, Fetal mortality. Maternal complications -Prolonged labour due to uterine inertia, Second trimester bleeding (4.1%) and abruptio placenta (4.2%), Increased operative interference.[5] Hence this study was undertaken to assess the outcome in oligohydramnios

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METHODOLOGY

Source of data: The present prospective study was conducted in the department of Obstetrics and Gynaecology, attached to J.J.M Medical College, Davangere, from January 2015 to December 2015. 100 cases (50 cases of oligohydramnios and 50 cases with normal AFI) were studied. Informed consent was taken from all patients. The criteria for selection of cases are based on detailed clinical history, like duration of amenorrhea, decreased fetal movements and leaking per vagina was enquired. A detailed Obstetric history regarding previous congenital abnormalities, oligohydramnios, pre-eclampsia were taken. In addition to this a previous history of diabetes mellitus, cardiac disease and renal diseases were recorded. On clinical examination presence of anaemia, pedal edema, and blood pressure were recorded. Routine clinical examination of cardiovascular system, respiratory system was done.

On per abdomen examination the following points were noted,

1. Uterine size whether it is corresponding to the period of amenorrhoea
2. Presence of IUGR
3. Presence of abdominal wall edema.
4. Position of the fetus
5. Presence or absence of fetal heart sounds.

If the cases were first seen during labour, a per vaginal examination was done to note the cervical effacement, dilatation, presentation, station of the presenting part, membranous state and the type of pelvis was noted.

For all women in the study group, ultrasound examination was done and amniotic fluid index was determined by four quadrant technique.

Inclusion criteria:

- Thirty seven completed weeks of gestation.
- Amniotic fluid index of ≤ 5cm.
- Intact membranes.
- Singleton pregnancy with cephalic presentation.
- High risk cases like – PIH and Post term pregnancies.

Exclusion criteria:

- Gestation age < 37 completed weeks.
- Associated fetal malformation.
- Ruptured membranes.
- Mal presentation.
- Multiple gestation.

The data was collected in proforma. Various outcome measures recorded were gestational age at delivery, parity, nature of amniotic fluid, mode of delivery, APGAR score at 1 min and 5 mins, birth weight, admission to neonatal ward, perinatal morbidity and mortality.

Descriptive data were presented as number and percentages with mean and standard deviation wherever required. Chi-square test was used for analysing categorical data. Student's 't' test was used for comparing mean between two groups. A p-value of 0.05 or les was considered statistically significant.

RESULTS

Mean age in study group was 23.36±3.46 years and in the control group was 23.08±3.22 years. In oligohydramnios group majority i.e. 35 (70%) patients were in the age group 21-30 years, 14 (28%) were in the age group of 16-20 years and 7 (2%) was 30 years. In the control group, with normal AFI, 37 (74%) patients were in the age group of 21-30 years, 12 (24%) were in the age group of 16-20 years and 1 (2%) was above 30 years. In the study group, 36 (72%) patients were primigravida, 8 (16%) were gravida 2, 4 (8%) were gravida 3 and 2 (4%) were gravida 4.In the control group, 28 (54%) were primigravida, 14 (28%) were gravida 2, 8 (16%) were gravida 3.Gravida status in the 2 groups had a p-value of 0.097, which is statistically not significant.52% of the patients were between 40-42 weeks gestation in both the groups.

Thirty one (62%) of the patients in the study group had non-consanguineous marriage, 12 (24%) had second degree consanguineous marriage, 6 (12%) had 3rd degree consanguineous marriage and 1 (2%) had first degree consanguineous marriage. In the control group 42 (84%) had non consanguineous marriage, 6 (12%) had second degree consanguineous marriage, 2 (4%) had 3rd degree consanguineous marriage. The consanguinity distribution in the 2 groups had a p-value of 0.05 which

is statistically significant.

Hypertensive disorders (PIH) was seen in 16% of the patients with oligohydramnios, anemia was seen in 8% and Rh negative status in 6% of the patients. The incidence of PIH was high in oligohydramnios. The control group was selected matching with the same maternal complications. The p value was 0.663 which was not significant.

In the study group, 23 (46%) patients had a reactive NST, 11 (22%) had non-reactive NST and 16 (32%) had variable decelerations. In the control group, 39 (78%) patients had a reactive NST, 4 (8%) had non-reactive NST and 7 (14%) had variable decelerations. The NST studied in the 2 groups had a p-value of 0.004 which is statistically significant.

The onset of labour in the two groups had chi-square value of 0.260 and 0.181 which was not statistically significant. In the study group 11 (22%) patients had normal delivery, 4 (8%) had instrumental delivery, and 35 (70%) had caesarean delivery. In the control group, 37 (74%) had normal delivery, 4 (8%) had instrumental delivery and 9 (18%) had caesarean delivery. The difference in the mode of delivery was found to be statistical significant between the two groups ($p<0.001$).

In the study group, amongst the patients who underwent caesarean delivery i.e. 35 patients, 19 (54.29%) were taken up for emergency LSCS and 16 (45.71%) were taken as elective LSCS.In the control group, amongst the patients who underwent caesarean delivery i.e. 9 patients, 7 (77.8%) underwent emergency LSCS and 2 (22.2%) were taken as elective LSCS.

Meconium stained liquor was seen in 13 (26%) of patients in the study group and 10 (20%) in the control group. Clear liqour was seen in 37 (74%) patients in the study group and 40 (80%) in the control group. The nature of amniotic fluid in the groups had a p value of 0.476 which was not statistically significant.

In the study group, 17 (34%) babies were less than 2.5 kg, 30 (60%) were between 2.5 to 3.5 kg and 3 (6%) were above 3.5 kg.In the control group, 12 (24%) babies were less than 2.5 kg, 36 (72%) were between 2.5 – 3.5 kg, and 2 (4%) were above 3.5 kg.The difference in the birth weights among the 2 groups had a p value of 0.05 which was statistically significant.

The Apgar scores at 1 minute was < 5 in 38% in the study group and 18% in the control group. The Apgar scores at 5 minute was < 7 in 30% in the study group and 24% in the control group .The p value for Apgar scores at 1 min and 5 min was statistically insignificant.

The number of NICU admission were 13 (26%) in the study group and 7 (14%) in the control group.There were 9 (18%) perinatal mortalities in the study group as compared with only 1 (2%) perinatal mortality in the control group value was 0.007, which is statistically significant.

DISCUSSION

Amniotic fluid index, a semi quantitative method of amniotic fluid estimation, has become an integral part of modified biophysical profile.Amniotic fluid volume is known to reduce the advancing gestational age in the present study 52% of women among oligohydramnios group were seen with gestational age in between 40-42 weeks.

Hypertensive disorders which cause chronic placental insufficiency lead to oligohydramnios. Raj Sriya et al,[6] had 31.9% patients with hypertenson, 9.7% patients had Diabetes Mellitus, and 2.7% patients had heart disease and 25% had post dated pregnancy. In the present study 16% of the patients had pre eclampsia, 6% of the patients had Rh negative blood group, 52% had post dated pregnancy, nearly 40% of the cases were found to be anaemic and 8% patients were severely anaemic.

Table 1: Occurrence of thick Meconium stained liquor in different studies

Studies	Thick meconium stained liquor (%)
Rutherford et al[7] (1987)	54%
Sarno et al[8] (1990)	41.9%
Chandra P et al[9] (2000)	23.7%
Raj Sriya et al[6] (2001)	38.38%
Umber et al[10] (2009)	6%
Present study	26%

The rate of non-reactive NST was 22% in the present study, which was low compared to other studies, such as Chandra P. et al[9] showing a 69.23% incidence, Raj Sriya

et al[6] showing a 41.55% incidence and Umber et al[10] showing an incidence of 52.7%.

Table 2: percentage caesarean delivery in different studies

Studies	Caesarean delivery (%)
Chandra P. et al[9] (2000)	76.92%
Casey et al[12] (2000)	51%
Raj Sriya et al[6] (2001)	43.05%
Umber et al[10] (2009)	32%
Guin et al[13] (2011)	42.8%
Visvalingam G. et al[14] (2012)	75.6%
Chate P. et al[15] (2013)	64%
Present study	70%

There was an 18% incidence of perinatal deaths in the oligohydramnios group in the present study. This is comparable with the study conducted by Chamberlain et al[16] with a 10.93% incidence of perinatal deaths. The perinatal outcome was studied in the two and it was found that the Apgar scores at 1 min and 5 min were better with the elective LSCS group as compared to emergency LSCS group.There were also no NICU admissions or perinatal mortality in the elective LSCS group suggesting better perinatal outcome in elective caesarean deliveries in cases of oligohydramnios

CONCLUSION

Oligohydramnios in course of pregnancy signals danger to the foetus, so a thorough evaluation of the foetus for congenital anomalies is a must, particularly if amniotic fluid is less (<5 cm).Ultrasonography is the best means of early detection of oligohydramnios and associated congenital malformations. Amniotic fluid index measurement can be used as an useful adjunct to other fetal surveillance methods, to identify those infants at risk of poor perinatal outcome.AFI ≤5 cm is associated with high incidence of thick meconium stained liquor, fetal distress, operative delivery and caesarean section, poor Apgar scores, low birth weight, meconium aspiration and perinatal morbidity and mortality. A careful study must be done for detection of etiological factors in all cases of oligohydramnios, to improve the foetal outcome and to reduce perinatal morbidity and mortality.

Conflict of Interest: None

Source of support: Self-funding

Ethical Clearance: Taken from Institutional Ethics committee

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Surveillance System Development based on NCD Inegrated Post (Posbindu PTM) as an Effort of Occupational Health Services

(A Study on the Port Health Office Employee of Class I Surabaya)

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ABSTRACT

Employee mostly spend time at work, this resulted in the majority of health behaviors in the workplace. Lack of physical activity in the workplace, job stress, and lack of control in food intake, coupled with lack of awareness of periodic health checks can be at risk for heart disease due to work. Adequate health information on employee of Port Health Office (PHO) Class I Surabaya not available, it is due to the lack of registration of medical examination of all employees.

This research is an action research which was conducted in February -May 2017. The informants in this study is the Head of Division, Head of Section, and the Staff implementing related programs. The research objective is to develop Non Communicable Diseases (NCD) Post (Posbindu) based surveillance system is running to become an occupational health surveillance system for employees. The results showed that the surveillance system of NCD Post ongoing produces information risk factors for non-communicable diseases in the community of port workers in general, which leads to cardiovascular disease, but still have not seen from the aspect of the job.

Data types in the development of the system on the input component to see aspects of the work of the risk factors of cardiovascular disease is by adding a variable work stress, physical activity in the workplace, fruit and vegetable consumption habits in the workplace. Development of the system design by drafting a mechanism for collecting, processing, analysis and interpretation of data, and dissemination of information by creating a context diagram, data flow diagrams and implementation guidance.

The conclusion that the design of surveillance systems for early detection of NCD based Posbindu can be developed into cardiovascular disease risk factor surveillance as a result of work on employees is one of the efforts of occupational health services.

Keywords: *Surveillance System, NCD Post, Employees*

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INTRODUCTION

Basic Health Research in 2013 stated that the prevalence of coronary heart disease in Indonesia in 2013 on the worker's age group (15-55 years) who were diagnosed at 1.3% and the doctor who diagnosed the doctor or symptoms by 5%. While the incidence of

coronary heart disease in the age group of workers (15-55 years) based on employment status, working as an employee has a prevalence rate of 0.4% were diagnosed with a doctor and diagnosed doctor or symptoms of 0.9% [6].

Nowadays, many people are busy to work so that they forget about their health. Health is important, especially the health of the heart. Disease apart by inheritance, can also be triggered by the work and the neighborhood where the peoplework[1].

Most of the time employees spent at work. This impacted on the majority of health behaviors in the workplace. Lack of physical activity in the workplace because most work is done at the front desk/ computer, stress due to work, and lack of control in food intake, coupled with lack of awareness of periodic health checks can be at risk for heart disease due to work.

Based on the preliminary studies that have been done, the Port Health Office (PHO) Class I Surabaya in 2016, has been running a health examination programs in order surveillance of risk factors for non-communicable diseases targeted at people working in the port area which includes also an employee of the Port Health Office itself using approaches Posbindu program Communicable Diseases (Integrated Non-Communicable Disease Post) which is a government program of the Ministry of Health.

In Indonesia, a listing on Posbindu done by using NCD Health Card (*Kartu Menuju Sehat PTM*) and Record Book Event Posbindu (*Buku Pencatatan Kegiatan Posbindu*). NCD Health Card is a card to record the condition of the individual patient risk factors for non-communicable diseases such as blood pressure, blood glucose, body mass index, cholesterol, and others who brought the patient while visiting Posbindu[2].

Employee health information PHO Class I of Surabaya adequate not been there, it is due to the lack of registration of a special medical examination for all employees. This research aims to develop Posbindu based surveillance system of Communicable Diseases (NCD Post) is running to become an occupational health surveillance system for employees.

MATERIAL AND METHOD

This research is an observational study design action research with qualitative methods. This research was conducted in the PHO Class I Surabaya which is one of the government-owned health institutions in the Health Sector. Research was conducted in February - in May 2017. The informants in this study was 2 Head of Division, 1 Head of Section, and 7 Staff implementing related programs in the PHO Class I Surabaya. The variable in this study is the input variables (human resources, infrastructure, funding, data types, and data sources), process (the mechanisms of collecting, processing, analysis and interpretation of data) and output (epidemiological information) of the surveillance system. The primary data collection using interviews and focus group discussions. Secondary data were collected using the method of study documents in the form of reports and related data files. Stages in data collection research is the description of the current system, the establishment of indicators, identification of the data and information required, and the preparation of the design process of the surveillance system. Research data processing and analysis was conducted using data reduction, presented descriptively portrayed in the form of tables, graphs, and images with narration, and do conclusion.

FINDING

NCD Post is a government program, namely the Ministry of Health. Implementation of NCD Post carried out by health workers who have been there, one of them from the workplace who are willing to organize.

PHO Class I Surabaya is a primary NCD Post type. Targets on the program NCD Post conducted are workers within the port (Tanjung Perak, Gresik, Tuban, and Kalianget) and Juanda International airport (Sidoarjo), both from public and private sectors (formal and informal), NCD Post program implemented as much as 1 times a year.

The results show that system ongoing surveillance which is providing early detection of Communicable Diseases with NCD Post approach examination include interviews history of the NCD factors from family and NCD history of themselves, smoking habit, the habit of physical activity, the habit of consumption of fruits and vegetables, and the habits of consumption of alcoholic beverages and measurement of height and weight to measure body mass index, waist circumference, blood pressure, blood glucose when levels of total cholesterol in the blood, and triglycerides in the blood that is carried

out by trained health personnel owned by PHO Class I Surabaya.

Information generated from system ongoing is about NCD risk factors in the community of port workers in general, which leads to cardiovascular disease. But still have not seen from the aspect of the job so far unable to update risk factors of cardiovascular disease caused by work to the worker.

For NCD Post based surveillance system development is required to developing the type of data collected which aims to be analyzed risk factors for cardiovascular disease due to their work in order to determine the health status of employees.

Specified risk indicators are family history, age, and gender, tenure, obesity, diabetes mellitus, dyslipidemia, fruit and vegetable consumption habits in the workplace, the habit of physical activity in the workplace, and work stress.

The risk factors for heart disease and blood vessels are family history, age, and gender, hypertension (systolic blood pressure and disatolik), smoking, diabetes mellitus (blood sugar random, fasting, 2-hour post-prandial, hemoglobin glycated), dyslipidemia (cholesterol total, HDL, LDL, and triglycerides), obesity, central obesity, physical activity, diet, alcohol consumption, and stress[5,8]. Age (p = 0.000), nutritional status (p = 0.000), physical activity (p = 0.000), and stress (p = 0.000) was significantly associated with blood pressure on inpatient hospital nurse Stella Maris Makassar[12]. Factors that proved to be at risk of CHD events in PT. Pupuk Kaltim is total cholesterol (p = 0.027), LDL (p = 0.010), hypertension (p = 0.009), and obesity (p = 0.020)[1].

Need assessment of data type in the development of the system is the data of age, sex, years of work, a history of hypertension, diabetes, hypercholesterolemia, heart disease, stroke of the family and self, smoking, drinking alcohol, fruit and vegetable consumption habits, fruit and vegetable consumption habits in the workplace, habits of physical activity, habits of physical activity in the workplace, job stress, height, weight, body mass index, waist circumference, blood pressure, blood sugar levels when, fasting blood sugar, blood sugar 2-hour post prandial, Hemoglobin Glycated (HBA1c), total cholesterol, LDL cholesterol, HDL cholesterol, triglycerides. Of all the types of data in the system requirements are developed, which cannot be met is the data needs of LDL cholesterol, HDL cholesterol, and levels of Glycated Hemoglobin (HbA1c)

Development of the system also requires a data source that play a role in providing data, which is implementing an NCD early detection program at headquarters (Tanjung Perak) and branches (Juanda, Gresik, Tuban, and Kalianget). All data in the resource needs of the developed system can be met in the development of this system can be met by the PHO Class I Surabaya by referring to the existing organizational structure.

To run an optimal surveillance, the number of persons required and minimal competence corresponding national indicators, namely 1 epidemiologist expert personnel (S2), 2 persons epidemiologist expert (S1) or skilled, and 1 doctors umum[7].

Competent resource needs in the field of Occupational Health is necessary to analyze the results of employee health in order to predict whether the events related to the employee health status due to work or not. The resource requirements can be met by maximizing the potential of the human resources that exist today in the PHO.

Need assessment for infrastructure in the system which was developed following the needs of the type of data to be collected. At PHO Class I Surabaya, there are problems to the provision of means of the spectrophotometer to analyze blood serum (glucose, cholesterol, LDL, and HDL) and chromatograph tools for examination HBA1c. The ingredients can be met, namely the use of rapid test for the measurement of blood sugar and total cholesterol for Easy Touch rapid test tools provide accurate glucose readings and precision for a wide range of concentrations glukosa[3].

Infrastucture need assessment are described in Table 1 below:

Existing System	Development System	Infrastructure Capabilities
Weight scales 1 unit Midline measuring tape 1 unit sphygmomanometer 1 unit stetoskope 1 unit rapid test blood sugar as much as 1 set rapid test cholesterol tests as much as 1 set rapid test examination of triglycerides as much as 1 set 1 unit of blood lancet Data collection instruments as much as 1 set the computer as much as 1 set printer 1 unit Internet Network	Weight scales 1 unit Measuring height (microtoise) 1 unit Midline measuring tape 1 unit sphygmomanometer 1 unit stetoskope 1 unit Blood sugar checks as much as 1 set HBA1c examination as much as 1 set cholesterol checks as much as 1 set LDL cholesterol checks as much as 1 set HDL cholesterol checks as much as 1 set examination triglycerides as much as 1 set 1 unit of blood lancet Data collection instruments as much as 1 set Instruments measuring job stress as much as 1 set the computer as much as 1 set printer 1 unit Internet Network	All facilities can be met, except: examination HBA1c LDL cholesterol tests HDL cholesterol tests

Needs assessment on the output component (epidemiological information) can be met in the development of a system to produce information how the employee physical activity in the workplace, how the consumption patterns of these employees during working hours, and how the stress level of the job which is associated with risk factors for cardiovascular disease.

High energy intake with physical activity are less active will have a higher risk (4 times) on the incidence of obesity compared with a high energy intake with physical activity are highly active against obesitas[13]. There is a relationship between stress and the incidence of diabetes mellitus (p-value = 0.01 and OR = 7.5) in Bandar Lampung police members in 2014[10]. There is a significant relationship between stress and hypertension (p-value = 0.000 and OR = 11.667) to nurses in hospital MedikaUtama Nusantara Jember[4].

Based on the potential of the institution and their opportunity to seize the opportunity is the reason for the development of sistem[14,15]. Development of the system design by drafting a mechanism for collecting, processing, analysis and interpretation of data, and dissemination of information by creating a context diagram, data flow diagrams and implementation guidance.

Officer is collect data by finding a source of data carried out by the implementing NCD program at headquarters and branch offices. Activities of occupational health surveillance data collection is active surveillance, the unit in charge of surveillance to collect data by visiting, searching, or tracing the source of data[2].

Data processing activities include data cleaning, corrections and re-check, then the data is processed by means of data recording, validation, coding, transform and grouping based on the variables place, time, and Persons[10]. Surveillance data processing is done by using computer tools and data processing programs.

Analysis of the data in terms of health and safety at work is done by taking into account aspects of the work (a habit of fruit and vegetable consumption in the workplace, the habit of physical activity in the workplace, and work stress) that is associated with the incidence of disease (obesity, central obesity, hypertension, hyperglycemia, dyslipidemia). The results of the analysis will provide direction in determining the magnitude of the problem, the tendency of the state, cause and effect of an incident, and the conclusion withdrawal[10].

The modeling *Data Flow Diagrams* (DFD) is done to describe the process of what is being done on the new system, which describes the process of entry and data

summary from entities or units that provide data.

CONCLUSION

The conclusion shows that the design of surveillance systems based on NCD Post that are running can be developed into a surveillance system of occupational health for employees in the form of a surveillance system of risk factors for cardiovascular disease due to work on the employee to make additions to the component inputs (type of data), component process (data collection, processing, analysis and interpretation of data specifically for employees with due respect to the work associated with the incidence of cardiovascular disease risk factors) and component output (dissemination of information according to the needs and availability of resources).

Conflict of Interest: None

Source of Funding: Faculty of Public Health, Airlangga University, Surabaya, Indonesia

Ethical Clearance The study was approved by the Health Research Ethics Committee of the Faculty of Public Health Airlangga University

All subjects were fully informed about the procedures and objectives of this study and each subject prior to the study signed an informed consent form.

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A Comparative Study of Pre & Post Stress Appraisal and Coping Strategies between Engineering and Pharmacy Students

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ABSTRACT

Academics is the phase in a student's life that used to be a major reason for generating stress. This study is aimed at finding the differences in stress appraisal of undergraduate students on the pre and post intervention of anindependent variable as fear or threat of exam and marks deduction. This study was also aimed to find the difference between coping strategies among two groups of students. The sample was selected from an Engineering college. 300 students of B.Tech second year and B. Pharmacy Second year(150 students from each stream) were taken as sample for the study. The Stress Appraisal Measure [SAM]was used to measure the level of stress appraisal before and after intervention of independent variable.The Brief COPE, a questionnaire was used to assess coping strategies adapted by the students of two educational streams. It was found that i) there is significant difference between pre and post assessment of stress appraisal scores among students and ii) the level of stress among B. Tech students was much higher and significantly differed with their pharmacy counterparts. The two groups also differed significantly in terms of their coping strategies where pharmacy students were much better than the B. Tech students. SPSS version 20 was used to analyze the quantitative data statistically.

Keywords: *Stress, Stress Appraisal, Professional Students, Stress Measurement, Coping Strategy.*

INTRODUCTION

etween Childhood and Adulthood, there is a stage of Human development, called Adolescence. Students of this age group, be it senior secondary school goers or undergraduates, experience self-organization and role confusion. These problem may further become reason for psychological disturbances and sometimes guide towards deviant behaviors. Lazarus and Folkman defined it in 1984 as stress is a mental or physical phenomenon formed through one's cognitive appraisal of the stimulation and is a result of one's interaction with the environment[1,2]. The existence of stress depends upon the existence of stressors. Feng and Wolpe defines stressors as anything that challenges an individual's adaptability or stimulates an individual's body or mentality [3]. For undergraduate students, stress mainly comes from academic tests, interpersonal relations, relationship problems, life changes and career exploration.

Appraisal is process of evaluating or categorizing the personal significance of events. In other words, students who perceive an event as a threat, rather than a challenge, are more likely to perceive that event as stressful. The process through which individuals interpret and respond to potentially stressful situations is known as cognitive appraisal. Cognitive Appraisal has been defined "as a process through which the person evaluates whether a particular encounter with the environment is relevant to his or her well-being, and if so, in what ways"[3]. Two types of appraisal, Primary and Secondary

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appraisal are cited in the literature[4]. The primary appraisal is the appraisal of stressful event on the basis of its potential harm, threat and challenge regarding the individual's own values, goals and beliefs. Harm/loss, appraisals are associated with events that have already occurred whereas threat and challenge events are most relevant to anticipated events. The Secondary appraisal is the appraisal of a stressful event on the basis of the individual's own resources or talents to cope with the situation or to overcome harm [5]. In other words, the individual decides which kind of coping resources are available to apply to the specific event [6].

College has been found to be stressful for many young adults. Past studies have reported that 75% to 80% of college students are moderately stressed and 10% to 12% are severely stressed[7,8]. Past research found that collegiate stressors include: academics, social relationships, finances, daily hassles and familial relationships[9-12]. Thus, physical, psychological, behavioural and academic difficulties were the cost of stress for college students. Research indicates that enrolled in professional programs such as engineering, pharmacy, appears to be at greater risks for the negative consequences associated with stress[13]. Pharmacy students may experience stress due to changing curriculum and models of practice within schools and colleges of pharmacy practice training and pharmacy practice sites. Students of the health profession (medical, pharmacy, dental and nursing) have been reported to exhibit high level of stress because of the nature of their educational process [14]. Pharmacy students demonstrate comparatively higher prevalence of stress than students of the other health professions which adversely affects their health and general quality of life[15]. Engineering students take half-yearly examinations so theoretically, the higher frequency of examinations should lead to a higher prevalence of stress among engineering students. However, there are very few studies on the prevalence of stress among engineering students, especially in India.

In addition to the previous studies of stress among professional, studies have predominantly been reported from USA, United Kingdom, United Arab Emirates, China and Malaysia [16]. However there are few studies on this topic in India, especially on populations in smaller cities.

The main goal of this study is to assess the differences of level of stress perception and their coping strategies among pharmacy and engineering students. The outcomes of this research study can be utilized in educational institutions to get awareness about the relationship between professional students and various stressful life situations which are perceived as stressful.

OBJECTIVES

Present study tries to address the following objectives:-

To study the differences between pre and post assessment of stress appraisal.

To study the differences of stress appraisal between engineering and pharmacy second year students

To study the differences in coping strategies adapted by engineering and pharmacy second year students.

Method

The current study is a Cross-Sectional study and the data was collected from a randomly selected sample of 300 students studying in KIET (Krishna Institute of Engineering & Technology), and KSOP (KIET School Of Pharmacy) Ghaziabad, U.P. Sample includes both Male and Female students between the age group of 17 – 22 yrs.Out of 300 respondents, 150 (75 Male and & 75 Female) students were engineering students and 150 (75 Male and 75 Female) were pharmacy students. Participants were asked to report demographic information including age, gender, period of study, nationality, religion, etc.

Tools

A stress questionnaire and a coping questionnaire tagged SAM and Brief COPE were used for the data collection for this study.

Stress Appraisal Measurement (SAM) was developed by Edward J. Peacock, & Paul T. P. Wong in 1990. It is a self-report instrument designed to measure an individual's appraisal of a specific stressful situation identified by the examiner / researcher. SAM has been only scale with college students. This instrument comprised of 28 items. Each item is rated on a five point Likert Scale regarding how an individual feels about a specific stressful situation; responses ranges from 1 "Not at all" to 5 "extremely". The subscale scores are calculated by summing the appropriate subscale items, and then dividing the total subscale score by 4 to create

an average subscale score.

Brief COPE: The Brief COPE was developed by Carver et al., in 1989 measures 14 dimensions of one's coping: seeking social support for instrumental reasons; seeking social support for emotional reasons; behavioural disengagement; self-blame, planning, venting of emotions, humor, acceptance, self-distraction, religion, positive reframing, substance use, active coping and denial. All questions are scored on a Likert scale ranging from 1 (I haven't doing this at all) to 5 (I've been doing this a lot). Each of the 14 subscales is comprised of 2 items (total 28 items). Total scores on each of the scales are calculated by summing the appropriate items for each scales. No items are reversed scored. Higher score indicates increased utilization of that specific coping strategy.

PROCEDURE

The researcher elucidates the purpose of this study to the respondents and assured the anonymity and confidentiality of the information they provided. Consent of respondent were obtained. During the administration of behavioural scales, each question was read out loudly and explained. A clarification was made whenever required. This study was done in two slots, pre-assessment and post-assessment. For pre-assessment data was collected with the help of instrument SAM. Here stress scores were taken as independent variable. Post-assessment was carried out after two months where fear of university exam results was increased among respondents by researcher's speech and then response on SAM was taken. Herefear of failure in exams was taken as independent variable.

RESULTS

The data was analyzed using the Statistical Package for the Social Sciences, version 20.0.0 (IBM SPSS Statistics). Mean, frequency, standard deviation as descriptive statistics was used to describe the data. To assess the difference and compare between the two data sets of pre and post assessment, paired t-test and MANOVA were used. The average age of the sample taken is 19 years. The mean scores of the male and female engineering students during pre-assessment were 74.09 and 76.79 and during post-assessment 110.27 and 111.19, respectively. The mean scores of the male and female pharmacy students during pre-assessment were 74.37 and 76.79 and during post-assessment 110.89 and 110.71, respectively. The overall mean score of all engineering students during pre-assessment were 75.44 and during post-assessment 110.73. The overall mean score of all pharmacy students during pre-assessment were 75.58 and during post-assessment 110.80, respectively. Table 1 shows the difference in means scores of pre-assessment and post-assessment data of engineering and pharmacy students. That indicates there is not much difference in perception of a stressful situation among same age group of students of two streams.

Table 1: mean scores of pre-assessment and post-assessment scores of engg. And pharmacy students

Gender of the student-pharma		Pre_Assessment Scores-engg	Post_Assessent Scores-engg	Pre_Assessment Score-pharma	Post_Assessment Scores-pharma
1	Mean	74.09	110.27	74.37	110.89
	Std. Deviation	5.794	6.317	5.858	6.264
2	Mean	76.79	111.19	76.79	110.71
	Std. Deviation	7.781	7.414	8.007	7.746
Total	Mean	75.44	110.73	75.58	110.80
	Std. Deviation	6.969	6.879	7.096	7.021

An intervention of threat and fear related to university examination was induced as dependent variable in the mindset of students before post-assessment. ANOVA was calculated to find whether the dependent variable as fear has significant role in increasing stress perception. It was found that value of F is 5.78 and Sig. is 0.17 which is lesser than

.05 which shows that there is a statistically significant difference between pre-assessment and post-assessment scores of engineering students. It was found that value of F is 4.438 and Sig. is .037 which is again lesser than .05 which shows that there is a statistically significant difference between pre-assessment and post-assessment scores of pharmacy students. Comparing the subscale scores from pre to post assessment showed that stress scores increased significantly when there was a threat intervention.

It was noted that out of 300 students, the most frequent used coping strategies were Planning (mean 6.14), Denial (mean 5.61), Emotional Reasons (mean 5.11), Venting Emotions (mean 5.09) and Instrumental Reasons (mean 5.06). The other coping styles were used less frequently by students.

Table 2 shows the differences of coping scores between Engineering and Pharma students. Pharmacy students scored more than Eng students on Instrumental reasons, Emotional reasons, Behaviour Disengagement and Venting Emotions.

Table 2: Differences between Coping Strategies of Engg. And Pharma Students

	branch of the students	N	Mean	Std. Deviation	Std. Error Mean
Instrumental Reasons	"BTech"	150	4.92	1.888	.154
	"Pharma"	150	5.20	2.007	.164
Emotional Reasons	"BTech"	150	5.09	1.781	.145
	"Pharma"	150	5.12	1.809	.148
Behav_Disengagement	"BTech"	150	4.28	1.177	.096
	"Pharma"	150	4.77	.991	.081
Self-Blame	"BTech"	150	4.04	1.220	.100
	"Pharma"	150	3.24	1.097	.090
Planning	"BTech"	150	6.28	1.264	.103
	"Pharma"	150	6.00	1.321	.108
Venting_emotions	"BTech"	150	4.57	1.476	.121
	"Pharma"	150	5.61	1.527	.125
Humor	"BTech"	150	4.92	1.526	.125
	"Pharma"	150	4.08	.938	.077
Acceptance	"BTech"	150	4.27	1.616	.132
	"Pharma"	150	3.76	1.379	.113
Self-Distraction	"BTech"	150	4.63	1.561	.127
	"Pharma"	150	4.68	1.439	.118
Religion	"BTech"	150	4.81	1.167	.095
	"Pharma"	150	4.63	1.748	.143
Positive_Reframing	"BTech"	150	4.39	1.086	.089
	"Pharma"	150	4.09	1.271	.104
Substance_Use	"BTech"	150	4.07	1.413	.115
	"Pharma"	150	3.93	1.151	.094
Active_Coping	"BTech"	150	4.93	1.354	.111
	"Pharma"	150	4.73	1.649	.135
Denial	"BTech"	150	5.56	2.048	.167
	"Pharma"	150	5.67	1.413	.115

It was also found thatfemale students scored more than male students on Emotional Reasons, Self-Blame, Humor, Religion and Active Coping.

DISCUSSION

Present study invested variation in primary and secondary appraisal and coping strategies during pre and post stress assessment, utilized by engineering and pharmacy students. Results indicated that students found that the intervention of fear of examination or marks deduction are stressful. Based on the results of this study, it seems that Engineering students are less prone to the development of stress compared to Pharmacy students. It may be due to Pharmacy students are exposed to many strenuous endeavors and rigorous training while preparing to become pharmacists; thus, some levels of stress associated with obtaining a pharma degree is expected.

We studied the different frequency of different coping strategies and found religious coping were present among female students. Substance use as a coping mechanism was minimal. Coping strategies are also associated with the understanding of a person with the ways he/she choose to manage the stress.

There are countless ways in which people may respond to the stressful situation; yet broadly classified then there are two coping styles i) Problem-focused and ii) Emotion-focused coping. Problem-focused coping refers the strategies to directly confront and deal with the demands of the situation. Emotion-focused coping refers the strategies that directly attempts to manage the emotional response that results from a stressful event. It has been found that problem focused coping strategies lead to favourable adjustment to stressors. On the other hand, emotion-focused coping strategies that involve avoiding feeling leads to poor adjustment to stressors ad depression. Here inthis study 300 students have scored higher on Instrumental Reasons and Planning. This shows that they are good at Problem-focused coping strategies.

CONCLUSION

Stress appraisal to be universally prevalent entity in all students, regardless of their age, sex, education, parent's occupation, and presence or absence of role model. Academic factors are sometimes most important factor for stress, so there is a need of specific and targeted measures to decrease burden of stress among students. Lack of students-friendly environment, especially for the students who are living in hostels, are sometimes work like stress-busters. For this feedback and complaints should be taken from students to overcome this problem. Health is a major concern, so promotion of healthy diet and lifestyle habits should be incorporated. Furthermore, teachers, parents and students should have an awareness about undue expectations of academic process, achievements, career that can lead to stress. Lastly, students of all fields must inculcate the habit of regular study habits and preparation strategies to avoid stress.

There are some limitations to this study. This study is based on the results from a self-administered questionnaire, hence reporting biasness cannot be eliminated. Compounding factors, such as respondent's emotional state and personality type, may be present.

Conflict of Interest: Nil

Source of Funding: We did not receive any grant/ fund and work done by self financing.

Ethical Clearance: This study is approved by Ethics Committee of KIET, Ghaziabad, UP

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Study of Prevalence of Risk Factors of Obesity and Hypertension among Urban Slum People of Uttar Pradesh

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ABSTRACT

92 male and 80 female patients of obesity were studied. BMI of males was 26 to 30, and in female BMI was 28 to 30. In males 62 (67.3%) and 48 (60%), females were without HTN, in male 30 (32.6%) and 32 (40%) female were with HTN. In males 18(9.5%) were leading sedentary life, 35(38%) were alcoholic 17(18.4%) were smokers, 22(23.9%) were tobacco chewers. In females 38(47.5%) were leading sedentary life, 19(23.7%) were alcoholic 23(28.7%) were tobacco chewers this study urban slum dwells suffering with dual problems of obesity and HTN will certainly help the community medical people to create awareness regarding . risk factors caused by obesity and HTN. As the consequence of risk factors are fatal and cannot be affordable by slum dwellers because of low profile of socio-economic status and Income, moreover slum dwellers work around the clock at the expense of their health which leads to stress and strain, untimely taking food and sleep which are the root cause of HTN and obesity.

Keywords – *HTN =Hypertension, UP= Uttar Pradesh, BP = Blood pressure, obesity.*

INTRODUCTION

Obesity is the excess storage of fat is surprisingly difficult to define and measure accurately. Obesity can be defined as arbitrarily as relative weight greater than height. It varies with sex and social class distribution. HTN and hyper lipidaemia are commoner in obese which helps to explain why fat people are excessively prone to ischemic heart diseases and cerebro-vascular diseases. These diseases are main reason for shorter life expectancy of the obese. The risk factor of obesity is increased risk of suicide, stroke, respiratory failure, coronary artery disease. HTN, gall stones, hernia, arthritis thrombo-embolism, clumsiness.(1) hypertension person has BP levels which are constantly raised above the accepted range except perhaps in sleeping. The causes cold be idiopathic, (race or genetic) run in families, acromegaly, coarcactation (delayed femoral pulse) Conn's syndrome, Cushing syndrome, phaechromocytoma, chronic nephritis, pregnancy but due to illiterate people who are unaware of risk factors of these two fatal diseases hence attempt was made to classify the sufferings of obesity and HTN patients with their habits and life style. So that awareness can be created among these urban slum dwellers.

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MATERIAL AND METHOD

The patients of both sexes regularly visiting Rajashree institute of medical sciences hospital Barelly (UP) were selected for study 92 males and 80 females were selected for study. The age group was 35 to 68 years. The lipid profile and BMI was Carried out to rule out their obesity and HTN.

Among 92 males 62 were obese with high BMI but non HTN reaming 30 were HTN. Among 80females 50 had obese (High BMI) but non HTN. Their age and causative factors of obesities and HTN were rule out. The duration of the study was 2 year.

OBSERVATION AND RESULT

Table-1 prevalence of BMI in both sexes-males 92 with BMI 26 to 30 females 80 with BMI 28 to 30

Table -2 comparative study of obese without HTN and with HTN in both sexes. - In males 62 (67.3%) obese without HTN. And 30 (32.6%) were obese with HTN In females 48(60%) were without HIN and 32 (40%) with HIN.

Table-3 Study of different habit and life style in obese and HTN male patients 18 (19.5%) had sedentary life 35(38%) were alcoholic 17 (18.4%) were cigreate smoking 22 (23.9%) were tobacco chewers.

Table -4 study of different habbits and life style in obese and HTN female patients 38(47.5%) were leading sedentary life 19(23.7%) were alcoholic 23(28.7%) were tobacco chewers

Table –1: Prevalence of obesity HTN in both sexes

No	Sex	Range of BMI	percentage
1	male	26 to 30	67.3%
2	Female	28 to 30	60%

Table -2: Study of obese with and without HTN in different age group

No of Male-92, No of Female-80

Sex	Obese without HTN	Perce-ntage	Obese with HTN	Percen-tage	Age group
Male	62	67.3%	30	32.6%	35-65
Female	48	60%	32	40%	36-60

Table-3:Study of different habits and life style of male patients

No of patients-92

No of Patients	Habits and Life style	Percentage
18	Sedentary life	19.5
35	Alcoholic	38
17	Cigarette smokers	18.4
22	Tobacco chewers	23.9

Table-4: Study of different habits and life style of female patients

No of patients-80

No of Patients	Habits of Life style	Percentage
38	Sedentary life	47.5
19	Alcoholic	23.7
23	Tobacco chewers	28.7

DISCUSSION

In the presents study of risk factors of obese an HTN among urbun slum people in UP. 92 male and 80 females. In males BMI varied from 26 to 30 and in females 28 to 30 BMI (Table-1). The obesity in both sexes could be due to genetic or sedentary life style and non –balance of food intake [(2)(3)] on the other obese patients with HTN 30 males (32.6%) and 32 females (40%) males aged between 35-65 year old and females 38 to 60 year old (table-2). HTN on important public health problem in both economically developed and under developing countries [(4).] but in our study most of the patients were suffering with primary HTN, Due to dietary sodium, obesity, stress[(5)] and some are due to excessive alcohol intake, smoking, tobacco chewing observed in our study of males 18(19.5%) were leading sedentary i.e 35(38%) alcoholic, 17 (18.4%) were smokes, 22(23.9) were tobacco chewers. (Table-3) In our study of females 38(47.5%) were leading sedentary life, 19.(23.7) were alcoholic, 23(28.7%) were tobacco chewers hence some are suffering with secondary HTN with coronary heart disease as they were smokers tobacco chewers and majority were alcoholic . The present study in more or less in agreement with previous studies [(6)(7)] . This obese people have binge eating disorder which is a sign of depressive illness [(8)]. In the presents study the alcoholism was observed in both sexes. The alcohol consumed by these urban slum area people is sub-standard, Hepato and renal toxic but most sedative such type of alcohol and tobacco chewers, smokers will be victims of diabetes , CVS diseases, Cholelithiasis, fatty liver, cirrhosis of liver, glomulonephritis, polynephritis, myxedema, hyper thyroidism etc. more over all this people of slum dwellers work holdday and eat heavily and comfortably in the night after consuming alcohol leads to night eating syndrome which enhances obesity which coincides with HTN[(9)]

Such obese and HTN also more prone for road accident due to Clumsiness[10]. It can't be denied that obesity and HTN occur simultaneously which end in pre-mature death leaving aside innocent and helpless dependents.

SUMMARY AND CONCLUSION

In the presents study of prevalence of obesity and HTN in people of urban slum areas is very important for community medicine staff to create awareness among the people about the risk factors of obesity and HTN. In addition to this there is need to create moral support among these slum dwellers because as they are staying in urban areas and wish to be rich and lead luxurious life like other affluent and well to do people hence it creates complexion among these slum dwellers to overcome such complexity they take alcohol, smoking, tobacco chewing habit which gives them temporary relief and euphoria which ends into multiple risk factors caused by obesity and HTN

This research work a approved by ethical committee of Rajashree medical college Barelly -243501(UP)

-No **Conflict of Interest**

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Dimensions of Patients Expectation in India

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ABSTRACT

Expectation is a supposed mental construction of events and circumstances that someone expect to take place in a given time and space. Every patient has expectations from the public health care industry and the fulfillment of the expectations and their satisfactions plays a vital role in the modern changing era as the Supreme Court of India has recognized right to access to health services as a fundamental right, yet in reality it is a distant dream for many. This study evaluates the expectations of a patient before admittance, during admittance and after the release and also investigates to what extent the government of India is succeeded in gratifying the prospects of the patients in comparison to the private sector health care industries.

Keywords: *Patient expectation, Hospital service, quality assessment, safety, administration*

INTRODUCTION

'Hope' as a term suggests a mental attitude constructed upon an expectation of positive outcomes related to some specific events and circumstances. [1] While Barbara Fredrickson links hope with crisis and resolution. Snider [2] connects as a path to actualize goals. Amanda [3] considers hope as an inner strength to recover from health crisis. Sometimes the term desire is used as a synonymous to hope. Desire is a psychological hedonism.[4] Hope, desire and expectations are synonymous terms, often used interchangeably. The word 'expectation' comes from the Latin word *expectationem* and implies a strong belief that something will happen or be the case.[5]

As I understand, expectation is a hypothetical mental construction of events and circumstances that the actor anticipate to take place in a given time and space. Expectation is a question of fact.

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The present write up analyses patient's expectation from health care service and critically examines the legitimacy of such expectations from judicial perspective. Judicial perspective in the context implies as to how the Supreme Court of India evaluates the patients expectation from legal perspective.

PATIENTS EXPECTATIONS

The General Comment No. 14 issued by the United Nations Committee on Economic, Social and Cultural Rights in 2000 states that the right to health in all its forms and at all levels contains the following interrelated and essential elements, the precise application of which will depend on the conditions prevailing in a particular State party such as (a) Availability (b) Accessibility (c) Acceptability and (d) Quality. Therefore, prior to the admittance in to the health facility every patient expects the above.

Oliver Kharraz points out three important expectations of patient like immediacy, choice and personalization.[6] The patient's expectation across gender, age, education (level of health information and typology of ailment will naturally differ.

In India health care is provided at three levels such as Primary, Secondary and Tertiary. From social contract perspective the legal expectation of a patient with respect to health care differs at every level. Though 70%

of India's population still lives in rural areas, specialized medical care is only available in and around urban hubs. [7].

Patient's expectations in health care and service play an important role in determining the legal rights of the patient. Patient's expectation differs at every level of treatment. These levels can be classified as (i) Expectation before Admittance (ii) Expectation during Admittance and (iii) Expectations after the Release.

Expectations Prior to Admittance

The expectations prior to the admittance includes (a) cordial and prompt reception (b) provide immediate medical support till doctor arrives (c) conduct diagnostics as advised by the doctor (d) facilitate admittance.

Every patient expects the hospital to be open 24 hours with appropriate doctors and supporting staffs present in the hospital. In India most patients expect some body to take charge immediately after arrival at the hospital. Both Patient and his attendant hate searching for the doctor or technicians. Sometimes, patients die due to non-availability of doctor [8] or die without being admitted in to the hospital [9]. There are occasions where patients either flee from the hospitals [10] or die unattended due to the strike of medical staff [11] . Doctors and hospitals refuse to admit patients under different pretext such as legal formalities [12], impossibility to recover [13], HIV patient [14], lack of facilities [15], and patient's incapacity to pay the bills [16].

India has just 1 Doctor for 1,674 people and there is shortage of 5 lakh doctor [17]. Only 33 percent of government doctor work in rural India [18]. As of March 2015, 8 per cent of India's 25,300 primary health centers had no doctor. More than 80% of community health centers, where specialists practice had no surgeons; 76 % had no obstetricians and gynecologists, 18 % have no pharmacists and 82 % had no pediatricians [19]. Strike, study leave for higher education and deliberate absenteeism substantially contributes to this problem. It is often alleged that doctors do not carry out their night duties[20]. Most patients and their attendants complain that during night hours they do not get proper medical attention both in Government and Private Hospitals. The attendant frantically search for doctors and nurses to attend their patient. Personally, we have also observed that during night most doctors, nurses and technicians sleep in their cabin locking from inside and if you wake them up they not only express their annoyance but also refuse to provide services in different pretext.

In emergency cases the patient expects basic facilities like oxygen, ventilator, blood and other transfusions and dressing of injury etc. There are several instances where patient succumbed to death due to lack of oxygen in the ambulance van [21]. The ambulance service in India are substandard, unqualified and even disastrous at places [22].

In most Government hospitals the in-house diagnostic centers are either nonfunctional or deliberately made nonfunctional for ulterior reasons. Sometimes doctors of well-equipped Government hospital refer their patients to private hospitals both for diagnostics and treatment for unknown reasons[23].

Expectation during Admittance

During admittance every patient expects several things that can be categorized as (i) Clean and healthy accommodation and provisions for basic amenities (ii) Periodic monitoring and support during emergency (iii) information on treatment. (iv) Cost details (v) Facilities for patient mobility (vi) quality nutrition

There are numerous instances where due to the negligence of doctor and supporting staff the patients suffer. In India, there are as many as 98,000 patients succumbing to death every year due to medical errors [24]. Cleanliness in Government Hospitals is a big issue in India. Patients are being treated in unhygienic conditions [25]. Recently, eleven mentally challenged inmates who died at Delhi Government's Asha Kiran Home. During inspection several lapses like overcrowding conditions, extremely unhygienic surroundings, and shortage of staff, dirty toilets and absence of proper medical care facilities were identified [26]. According to a survey conducted by Water Aid India, 343 healthcare institutions across six states often lacked basic hygiene, toilets, clean water and waste disposal. Unhygienic hospitals a reason for India's high maternal and infant mortality rates [27]. Incapacitated patients often find it difficult to move without wheel chair or attendant [28]. There are instances where the wife drags her ailing husband to the first floor of the hospital in the absence of wheel chair or stretcher[29]. It is a matter of disgrace that sometimes patients are served food on the floor of the hospital [30]. Further, it is noticed that basic amenities like electricity is not provided resulting the death of patients [31].

So far as information to patient and cost details are concerned most Indian hospitals are not transparent. Every patient has the right to know with respect to nature of ailment, line of diagnosis and treatment, nature and schedule of medication and expenditure details. Sometimes the patients express their dissatisfaction over billing [32], cost of medicine [33] and line of treatment [34]. There are instances where the dead are kept under ventilation to inflate the bill [35].

Expectations after Discharge

It has been reported that 30 percent of all hospital discharges are delayed for non-medical reasons[36]. Significance of timely release from hospital has been discussed by many [37]. Discharge planning is a systematic activity that requires expertise and experience [38]. Forceful discharge from hospital is a common problem in India [39]. Sometimes, patients were held back for economic consideration [40].

Some of the common expectations of the patients after the discharge from the hospital includes, (a) follow up consultancy and treatment (b) proper referral to expert in case of emergency (c) No fresh registration cost. In India, hospital discharge planning is in a rudimentary stage. Unless hospital authorities and doctors are trained in this regard, it cannot benefit the patients.

CONCLUSION

Statistics indicate that access to health in rural India is limited. It has been reported that 70% of the urban household and 63% of the rural household depend upon private hospitals [41]. Since the quality of health services in government hospitals are not up to mark the private health service provider take the advantage to gain commercially. Even if the Supreme Court of India has recognized right to access to health services as a fundamental right [42] yet in reality it is a distant dream for many. While patients generally prefer government hospital for economic reasons however in complicated cases they opt for private hospitals. Since the patients availing health services at government hospitals are not treated as consumer under the Consumer Protection Act, 1986, their legitimate expectations are unenforceable. But, at private hospitals they can claim the services as matter of consumer right. Therefore, materialization of the patient's expectation depends upon the consumer status of the patients.

Most patients and their attendants expect prompt and cordial reception at hospital. But, the predatory commercial attitude of doctors dilutes the patient's expectation [43]. Unfortunately, in India medical students and professionals are not trained to respond to the patient's expectation, further, patients complain about unnecessary diagnostics, non-availability of doctors and nurses at the time of need, unhygienic accommodation and exuberant billing. The cost of medical education and technology are often considered as a contributing factor for high cost health services.

Generally the patients and the attendants come to the hospital as distress person and it is very difficult to predict their nature, expectation and reactions [44]. At times, non-fulfillment of expectations can trigger violent reactions. It is reported that majority of attacks on doctors takes place in government hospitals [45].

Therefore, keeping the above situations in view three important issues need to be addressed to meet the patient's expectations such as prompt response, cordiality and positive communication between doctor and patient. In the Public and Private health sectors the doctors, hospital authorities and the supporting staffs need to trained by professionals to improve the quality of the health service.

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Determining Relationship of Dental Utilization with Optimism, Life Satisfaction, and Self-Reported Oral Health among Adult Population in Udupi Taluk, India

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ABSTRACT

Background: Dental care utilization has been documented over the years and shown association with many factors. So aim of this study is to determine the relationship of dental utilization with optimism, life satisfaction, and self-reported oral health.

Materials and Method: A cross-sectional survey consisting of structured questionnaire on demographic characteristics, dental utilization, self-reported oral health, optimism and life satisfaction was done on Udupi population.

Result: Out of 390 patients, 317 returned the completed questionnaire (response rate-81%). Bivariate logistic regression analysis shows gender, marital status, location, SES, those satisfied with their life, self-reported decay, and self-reported missing teeth were significantly associated with dental utilization. Multivariate logistic regression analysis shows gender, location, upper SES, self-reported decay, and self-reported missing teeth were significantly associated with dental utilization. Marital status and life satisfaction and optimism were not significantly associated with dental utilization.

Conclusion: Socioeconomic factors along with psychological aspects and self-reported oral health have an influence on dental utilization of the individual.

Keywords: *Dental utilization, optimism, life satisfaction, self-reported oral health*

INTRODUCTION

Over the years, dental care utilization has been documented worldwide.[1,2] Many factors found to influence dental care utilization include sex, age, education level, income, race, ethnicity, geographic location, general health and dental insurance status. Women consistently have been reported of having frequent dental check-ups than men.[2,3] Age has been correlated with dental utilization, as less frequent attendance has been observed in younger and older age groups.[2-4] The influence of income and education levels on preventive dental visits has been reported by many investigators.[2-6] Generally, income and education levels are related positively to frequency of dental utilization.

While the influence of demographic and access factors on dental utilization behaviour has been reported extensively, the relation of more subjective variables such as dental anxiety or satisfaction with one's mouth or life have received less attention.[3,4] Several psychosocial features such as sense of coherence, locus of control,

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self-efficacy, life satisfaction, and optimism have been identified in health research as being connected with several health outcomes.[7,8] Optimism has been connected with better recovery from operations,[9] preventive health behavior and avoidance of risk behaviour.[10] Life satisfaction has been associated with personality features, psychiatric morbidity, and disease mortality.[11]

Perceived dental need is another important factor which can affect the use of dental services.[12] Perceived dental treatment needs often differ from dentists' treatment recommendations. In addition, perceived needs, when influenced by symptomatic experiences, have greater effect on predicting dental care utilization. [13] The relationship of self-reported factors like decay, symptomatic teeth or missing teeth to dental care utilization has not been studied extensively. Studies connecting psychological factors with the use of dental health services are scarce. So aim of this study was to determine the relationship of dental utilization with optimism, life satisfaction, and self-reported oral health among adult population in Udupi Taluk, India.

MATERIALS AND METHOD

This cross-sectional study was done on patients attending dental clinic in Udupi. Participants were convenience sample of adults aged above 18 years seeking treatment in Comprehensive Dental Care centre, TMA Pai Hospital, Udupi. This centre caters to population of Udupi district and surrounding areas. The ethical approval was obtained from institutional ethical committee. All those patients who provided informed consent were included. Patients below age of 18 years and those not willing to participate were excluded.

Sample size was calculated to be 308, taking power of test as 0.80 and p-value of 0.05 to claim statistical significance. Patients were given self-administered questionnaires on demographic characteristics, dental utilization; self-reported oral health, optimism and life satisfaction. Out of 390 participants, 317 returned the completed questionnaire (response rate-81%). 73 declined to participate in the study with reasons being no time (n=43), incompletely filled questionnaire (n=23) and no reason given (n=7).

The questionnaire consisted of demographic characteristics like gender, location, marital status, education, income, occupation. Kuppuswamy scale was used to calculate socioeconomic status(SES) and categorized into lower, middle and upper class.[14] Dental utilization were assessed using question: "How often do you have dental-check-ups?" ("atleast once a year, once in two years, more rarely and never"). Respondents were classified into two categories: those who went for dental check-ups atleast once in two years and those who went more rarely.

Self-reported oral health was determined as: "In your opinion, do you have caries in your teeth at present? (Yes/No)". "Do you have toothache or other symptoms in your mouth at present?" (Yes/No). Respondents were asked to report number of missing teeth they had (0, 1-5, 6-10, more than 10 but not all, all). The respondents were classified into two categories: those who had no teeth missing and those who had atleast one missing teeth.

Life satisfaction was assessed: "Are you satisfied with life in general? The options were 1-Very satisfied, 2-Fairly satisfied, 3-Fairly dissatisfied, 4-Very dissatisfied. Fairly dissatisfied and very dissatisfied were combined due to low number of replies.

Optimism was measured by using revised version of Life Orientation Test(LOT-r),[15] a measure of dispositional optimism developed by Scheier and Carver. [10] This test assesses individual differences in generalized outcome expectancies, where positive expectancies were associated with optimism and negative ones with pessimism. Respondents were asked to rate the extent of their agreement to 6 items across 5-point Likert scale ranging from 0(strongly disagree) to 4(strongly agree). Optimism score was classified into four categories based on distribution (0-13, 14-16, 17-19, and 20-24).

Statistical analysis was carried out using SPSS vs 16.0. Bivariate logistic regression analysis was done to calculate unadjusted odds ratio with 95% CI for dental utilization atleast once in 2 years. Adjusted odds ratio with 95% CI for dental utilization atleast once in 2 years and selected variables were calculated using multivariate logistic regression analysis. The cut-off level for statistical significance was taken at 0.05.

FINDINGS

Out of 390 participants, 317 who completed the questionnaire, 62.4% have dental utilization atleast once in 2 years. Baseline characteristics of participants

are presented in Table 1. More females(73.2%) and urban participants(77.3%) reported to had dental utilization atleast once in 2 years as compared to males(52.4%) and rural participants(44.8%). Dental utilization was significantly related to socioeconomic status of participant. 96.2% of subjects in upper SES had visited dentist atleast once in 2 years, compared to only 38.2% of subjects in lower SES. The participants very satisfied(68.2%) from their life had more dental utilization as compared to fairly dissatisfied participants(53.1%). Subjects with highest optimism score(65.6%) had more dental utilization as compared to those with lowest optimism score(53.8%).

The bivariate logistic regression analysis shows gender, marital status, location, SES, those very satisfied with their life, self-reported decay, and self-reported missing teeth were significantly associated with dental utilization(Table 2). Females had 2.5 times odds of having dental utilization atleast once in 2 years as compared to males. Married participants, visited dental clinics more frequently (OR=2.167). Urban people were 4.197 times likely to visit dental clinics atleast once in 2 years than rural people. Participants in upper SES, had 41 times and middle SES, twice likely to have dental utilization atleast once in two years as compared to lower SES. Those very satisfied and fairly satisfied had frequent dental visit as compared to fairly dissatisfied people(OR=1.9 and 1.4). Respondents having high optimism scores had frequent dental utilization as compared to lowest optimism score. Self-reported decay and missing teeth had inverse relation with dental utilization. Self-reported pain was not significantly associated with dental utilization.

The multivariate logistic regression analysis showed that gender, location, upper SES, self-reported decay, and missing teeth were significantly associated while marital status and life satisfaction were not significantly associated with dental utilization (Table 3). Table 4 shows gender, location, upper SES, self-reported decay, and self-reported missing teeth were significantly while marital status and optimism were not significantly associated with dental utilization.

Table 1: Baseline characteristics of participants

Variables		Outcome		
		Dental utilization more rarely	Dental utilization atleast once in 2 years	Total
Gender	Male	78(47.6%)	86(52.4%)	164(100%)
	Female	41(26.8%)	112(73.2)	153(100%)
Location	Urban	39(22.7%)	133(77.3%)	172(100%)
	Rural	80(55.2%)	65(44.8%)	145(100%)
Marital	Married	76(32.6%)	157(67.4%)	233(100%)
	Single	43(51.2%)	41(48.8%)	84(100%)
Socio-economic Status	Lower(<11)	42(61.8%)	26(38.2%)	68(100%)
	Middle(11-25)	74(43.5%)	96(56.5%)	170(100%)
	Upper(> 25)	3(3.8%)	76(96.2%)	79(100%)
Life satisfaction	Very satisfied	42(31.8%)	90(68.2%)	130(100%)
	Fairly satisfied	47(38.8%)	74(61.2%)	121(100%)
	Fairly dissatisfied	30(46.9%)	34(53.1%)	64(100%)
Optimism	0-13	30(46.2%)	35(53.8%)	65(100%)
	14-16	29(40.3%)	43(59.7%)	72(100%)
	17-19	49(33.1%)	99(64.1%)	148(100%)
	20-24	11(34.4%)	21(65.6%)	32(100%)

Cont... **Table 1: Baseline characteristics of participants**

Self-reported decay	Yes	86(42.8%)	115(57.2%)	201(100%)
	No	33(28.4%)	83(71.6%)	116(100%)
Self-reported pain	Yes	60(40.8%)	87(59.2%)	147(100%)
	No	59(34.7%)	111(65.3%)	170(100%)
Self-reported missing teeth	No missing teeth	51(48.1%)	55(51.9%)	106(100%)
	Missing teeth	68(32.2%)	143(67.8%)	211(100%)

Table 2: Bivariate logistic regression analysis showing unadjusted odds ratio (OR) with 95% confidence intervals (CI) for dental utilization atleast once in two years according to different variables:

	No. who had check-up atleast once in two years/ all respondents	**Crude OR (95% CI)**	**P-value**
Gender			
Female	112/153(73.2%)	2.478(1.55-3.97)	<.001
Male*	86/164(52.4)	1	
Marital status			
Married	157(67.4%)	2.167(1.3-3.6)	.003
Single*	41(48.8%)	1	
Location			
Urban	133/172(77.3%)	4.197(2.58-6.8)	<.001
Rural*	65/145(44.8%)	1	
Socioeconomic status			
Lower*	26(38.2%)	1	
Middle	96(56.5%)	2.096(1.18-3.72)	.012
Upper	76(96.2%)	40.9(11.6-143.1)	<.001
Life satisfaction			
Very satisfied	90(68.2%)	1.891(1.025-3.5)	.042
Fairly satisfied	74(61.2%)	1.389(.753-2.56)	.292
Fairly dissatisfied*	34(53.1%)	1	
Optimism			
0-13*	35(53.8%)	1	
14-16	43(59.7%)	1.271(.645-2.5)	.488
17-19	99(64.1%)	1.732(.954-3.1)	.071
20-24	21(65.6%)	1.636(.68-3.9)	.271
Self reported decay			
Yes	115(57.2%)	0.532(.325-.868)	.012
No*	83(71.6%)	1	
Self reported pain and other symptoms			

Cont... **Table 2: Bivariate logistic regression analysis showing unadjusted odds ratio (OR) with 95% confidence intervals (CI) for dental utilization atleast once in two years according to different variables:**

Yes	87(59.2%)	0.771(.489-1.216)	.263
No*	111(65.3%)	1	
Self reported missing teeth			
No missing teeth*	55(51.9%)	1	
Missing teeth	143(67.8%)	1.95(1.20-3.145)	.006

*Reference category, P < 0.05, considered as significant

Table 3: Multivariate logistic regression analysis showing adjusted odds ratio (OR) with 95% confidence intervals (CI) for dental utilization atleast once in two years and selected variables along with life satisfaction:

	No. who had check-up atleast once in two years/ all respondents	**OR (95% CI)**	**P-value**
Gender			
Female	**112/153(73.2%)**	**2.599(1.473-4.586)**	**.001**
Male*	**86/164(52.4)**	**1**	
Marital status			
Married	**157(67.4%)**	**1.217(.619-2.394)**	**.569**
Single*	**41(48.8%)**	**1**	
Location			
Urban	**133/172(77.3%)**	**2.899(1.609-5.223)**	**<.001**
Rural*	**65/145(44.8%)**	**1**	
Socioeconomic status			
Lower*	**26(38.2%)**	**1**	
Middle	**96(56.5%)**	**1.791(.920-3.486)**	**.087**
Upper	**76(96.2%)**	**35.427(9.064-138.466)**	**<.001**
Life satisfaction			
Very satisfied	**90(68.2%)**	**1.216(.557-2.652)**	**.623**
Fairly satisfied	**74(61.2%)**	**0.965(.456-2.045)**	**.926**
Fairly dissatisfied*	**34(53.1%)**	**1**	
Self reported decay			
Yes	**115(57.2%)**	**0.505(.267-.955)**	**.036**
No*	**83(71.6%)**	**1**	
Self reported missing teeth			
No missing teeth*	**55(51.9%)**	**1**	
Missing teeth	**143(67.8%)**	**3.632(1.808-7.298)**	**<.001**

*Reference category, P < 0.05, considered as significant

Table 4: Multivariate logistic regression analysis showing adjusted odds ratio (OR) with 95% confidence intervals (CI) for dental utilization atleast once in two years and selected variables along with optimism:

	No. who had check-up atleast once in two years/ all respondents	**OR (95% CI)**	**P-value**
Gender			
Female	112/153(73.2%)	2.586(1.464-4.567)	.001
Male*	86/164(52.4)	1	
Marital status			
Married	157(67.4%)	1.187(.603-2.339)	.620
Single*	41(48.8%)	1	
Location			
Urban	133/172(77.3%)	3.046(1.680-5.523)	<.001
Rural*	65/145(44.8%)	1	
Socioeconomic status			
Lower*	26(38.2%)	1	
Middle	96(56.5%)	1.85(.954-3.586)	.069
Upper	76(96.2%)	35.429(9.078-138.267)	<.001
Optimism			
0-13*	35(53.8%)	1	
14-16	43(59.7%)	0.784(.341-1.803)	.567
17-19	99(64.1%)	1.177(.559-2.477)	.668
20-24	21(65.6%)	1.007(.333-3.046)	.990
Self reported decay			
Yes	115(57.2%)	0.504(.267-.951)	.034
No*	83(71.6%)	1	
Self reported missing teeth			
No missing teeth*	55(51.9%)	1	
Missing teeth	143(67.8%)	3.703(1.838-7.461)	<.001

*Reference category,

$P < 0.05$, considered as significant

DISCUSSION

This study had shown that socioeconomic factors along with optimism and life satisfaction played an important role in determining dental utilization. The observed relation of life satisfaction and optimism to dental utilization was similar to findings of other studies connecting life satisfaction and optimism with positive health outcomes.[7,8]

Gender difference in dental care utilization has been consistently reported in various studies which was also found in our study that women having dental check-ups frequently than men.[2-4,6,8] This could be due to high aesthetic concern and dental awareness among females. Although Woolfolk found no statistically significant difference in percentage of men and women having atleast one dental check-up a year.[1]

The married people had frequent dental visits as compared to unmarried which was in line with other studies.[7,8] Urban people had high frequency of dental utilization than rural. This could be due to high availability of dental health services in urban areas as compared to rural areas and high SES of urban people.

The present study showed significant relationship between dental utilization and socioeconomic status of participant which was in concordance with previous literature.[2,3,5-8] Dental services tend to be used less by people of lower occupational status, lower level of education, and income brackets.[5,16,17] The people with low SES had higher SILOC scores and history of postponing needed dental visits. [18]

Optimism was measured by means of LOT-r. The test has been widely used for years and validity has been proven.[15] The test has also adequate discriminant validity in relation to neuroticism[15,19] and depression[20]. Life satisfaction was measured by using single question. Single-item measures have larger variability, but their strength is simplicity and is thus useful measures on subjective well-being and is not so easily affected by current mood than multiple-item measures.[21]

Dental utilization cause stress in many people and it had previously been found that optimism improves the capacity to handle stress. In addition, optimism was closely linked to self-efficacy which had also been linked to dental visits in earlier studies. The present study reported that those with high optimism scores had more frequent dental utilization as compared to lowest optimism score.

A relationship was observed between dental utilization and life satisfaction. Previously it had been found that life satisfaction was connected with personality features, psychiatric morbidity and disease mortality. Moreover life satisfaction was connected with a strong sense of coherence, which in turn had been linked to several positive health outcomes including psychological and physical well-being. The present study showed that very satisfied and fairly satisfied had more frequent dental visits as compared to fairly dissatisfied people. This study also found that self-reported decay and self-reported pain were inversely associated with dental utilization (odds ratio <1) which was similar to finding of other studies. [7,8]

Conclusion: Socioeconomic factors along with psychological aspects and self-reported oral health have an influence on dental utilization of the individual.

Conflict of Interest: Nil

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Epidemiological Study of Knowledge, Attitude and Practice Regarding Dengue in Residents of Slum Area of Ujjain, MP

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ABSTRACT

Background & objectives: Dengue fever is a re-emerging vector-borne viral illness that is endemic in Tropics and poses a major public health burden in many countries of South East Asia. The objectives of the study were to assess the knowledge, attitude and preventive practice among study subjects about dengue fever. **Method:** A cross sectional study was carried out among the 400 patients attending urban health center of RDGMC, Ujjain, MP from 1st to 31st December, 2012 who came from the catchment area of the center by means of interview method. **Interpretation:** The knowledge of respondents was good and most respondents were able to correctly relate to the symptoms of dengue like fever, vomiting, headache and rashes. Gap in the knowledge was observed in the responses regarding breeding sites. Knowledge on various variables regarding preventive measures and management strategies for the disease was high. With regards to KAP scores, 57.5% of participants achieved at least 80% on the knowledge score, 43% obtained at least 80% on the attitude score and 30.25% obtained 80% on the preventive practices scale. **Conclusions***:* The study delineates the difference in the level of knowledge about the disease which does not commensurate with attitudes and practices directed at reducing the dengue infection prevalence. Dengue disease prevalence can be reduced only by full community involvement which could only be gained by raising community's awareness on the topic and the need to change the attitude and increase the preventive practice against dengue infection.

Keywords: *Dengue, Knowledge, Attitude, Practice*

INTRODUCTION

Dengue is an acute febrile illness caused by Flavivirus, and is the most common disease among all the arthropod-borne viral diseases. Due to occurrence of remarkable changes in the epidemiology of dengue, currently dengue ranks as the most important mosquito-borne viral disease in the world[1]. World Health Organization currently estimates that 50–100 million dengue infections occur worldwide every year. Before 1970, only nine countries had experienced severe dengue epidemics. Today, the disease is endemic in more than 100 countries in African, Americas, Eastern Mediterranean, South-East Asia and the Western Pacific regions. An estimated 500000 people with severe dengue require hospitalization each year, a large proportion of whom are children[2]. Dengue transmission is effected through female mosquitoes, i.e., Aedes aegypti, Aedes albopictus. Dengue fever may transform into dengue hemorrhagic fever and dengue shock syndrome. These conditions are fatal causing hemorrhages and leakage of plasma respectively[3]. The illness often begins with a sudden rise in temperature accompanied by facial

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flush and other flu-like symptoms. There is no specific treatment for dengue fever, so prevention is imperative. The only method to combat the disease is to stop the breeding of its vector. It could be achieved by defensive (mosquito nets, screening, coils/matt, repellents), offensive (spraying, fogging, oiling) and corrective (environmental up-gradation, piped water supply etc) measures[4]. The social and economic burden caused by the disease raises the need to create awareness among community members on disease recognition, actions which reduce vector-human interaction and help to eradicate breeding sites both at household and community levels[5]. In recent years, Dengue Fever continues to be a major public health problem in India[3]. Considering the magnitude of the problem the present study was undertaken to assess the knowledge of the community regarding dengue, their attitude and the preventive practices undertaken by them.

MATERIALS AND METHOD

The cross sectional study was commenced at Medical OPD of urban health center of R. D. Gardi Medical college, Ujjain, MP. About 400 subjects above age 15 years were incorporated in the study. The patients of either sex were included in the study. The patients who were seriously ill and unable to participate in the study were excluded. The data were collected using face to face interview technique. The patients of either sex were included in the study. The patients who were seriously ill and unable to participate in the study were excluded.

Ethical Consideration: The verbal informed consent was obtained prior to data collection. The confidentiality was maintained by coding the patient's respondents' name in the interview form. The privacy was maintained by interviewing in a quiet and separate place.

Statistical Analysis: SPSS program version 16 was used for data analysis.

Study instruments and data collection: Data was collected from 400 respondents where they were assessed for their knowledge, attitudes and practices regarding dengue using an pilot tested and semi-structured questionnaire. The questionnaire covered the following areas: (1) demographic information (district, sex, age, family type, education and socio-economic status); (2) health information about the respondent whether they had dengue disease or not; (3) knowledge about dengue symptoms, signs, and transmission modes; (4) respondent's attitude towards dengue; (5) preventive practices used by study subjects against dengue.

DATA ANALYSIS AND RESULTS

The data were analyzed using SPSS software version 16. Frequency tables were prepared for the socio-demographic variables and for knowledge, attitudes and preventive practices. Responses to questions were coded such that correct answers were scored 1 and incorrect answers were scored 0. These were added to arrive at a single value out of a possible total score of 26 for knowledge, 3 for attitude, and 11 for practice. Respondents were considered to have adequate knowledge if they correctly answered 80% of the questions. Results (Table-1) showed the mean age of study participants as 34.6 years (Range 15 to 68) with 51% of respondents as females. Maximum respondents were from nuclear family (41.25%) and 66% were from Middle lower middle SES. Maximum (35.5%) respondents had completed their high school education.

Table 2 shows the knowledge about dengue fever. Knowledge was assessed based on questions grouped under the following three categories: 1) Knowledge of the symptoms of dengue 2) Knowledge of dengue transmission 3) Knowledge of dengue management. These are shown. Respondents were considered to have adequate knowledge if they correctly answered 80% of the questions. About 77.75% of respondents were able to identify fever as symptom of dengue followed by 53.25% for vomiting, 41.25% for headache and 44.50 for rashes. Most participants (71.25) were aware that mosquitoes transmit dengue fever, whereas 68.25% knew about water as mode for disease transmission. When asked about their knowledge about available measures to prevent contact with mosquitoes, many respondents (87.25%) were aware that screening windows and using bed nets reduced contact with mosquitoes. About (94%) cited use of insecticide sprays while 72% felt that covering water containers reduce mosquito breeding. About the management measures, 91.25% respondents knew that treatment is available for dengue, while 76.50 mentioned the need to consult a physician for the same. 66.25% mentioned plenty of rest while 52% mentioned drinking of plenty water as important in managing dengue fever.

About the source of information regarding dengue

fever (Table-3), 89% mentioned TV/Radio, 84% mentioned it as newspaper, 49% mentioned it as health-workers. Table 4 shows the attitude of respondents regarding dengue disease. When asked about the seriousness of illness, 60.75% respondents strongly agreed to it while 30.25% agreed to it. Only 19.5% strongly agreed, 16.75% agreed while majority 33.50% disagree that they are at a risk of getting dengue. Also, 27.5% respondents agree, 24.75% strongly agree while 22.75% strongly disagree that dengue fever can be prevented.

Table 5 display the preventive activities used to avoid contact with mosquitoes. For instance, 66% used insecticide spray, 34% used mosquito coils to reduce mosquitoes, 33.75% used fans to reduce mosquitoes while 30.5% used screen windows to reduce mosquitoes.

With regards to KAP scores, 57.5% of participants achieved at least 80% on the knowledge score, 43% obtained at least 80% on the attitude score and 30.25% obtained 80% on the preventive practices scale.

Table 1: Distribution of Socio-demographic characteristics of study participants

Demographic characters	Frequency (n=400)	(%)
Age (yrs)		
15-24	104	26
25-34	126	31.5
35-44	77	19.2
45-54	59	14.7
>54	34	8.5
Sex		
Male	196	49
Female	204	51
Family type		
Nuclear family	165	41.2
Third generation family	86	21.5
Joint family	149	37.3
Literacy status		
Illiterate	82	20.5
Primary	77	19.2
High school	142	35.5
Intermediate	47	11.7
Graduate	37	9.2
Post graduate	15	3.7
Socio-economic status		
Upper	11	2.7
Upper middle	57	14.3
Middle lower middle	264	66.0
Lower upper lower	68	17.0

Table 2: Knowledge among respondents regarding dengue fever

Response	Participants with correct response	Percentage
Symptoms	**Yes**	**%**
Fever	311	77.75
Headache	165	41.25
Rash	178	44.50
Vomiting	213	53.25
Retro bulbar pain	99	24.75
Bleeding	159	39.75
Unconsciousness	115	28.75
Transmission		
Mosquitoes	285	71.25
Water	273	68.25
Breeding time	199	49.75
Season of breeding	211	52.75
Breeding sites		
Stagnant water	313	78.25
Artificial collection of water	183	45.75
Tyres/coolers	198	49.50
Bath tubs	156	39.00
Preventive measures		
Window screen and bed nets	349	87.25
Insecticide sprays	376	94.00
Covering water containers	288	72.00
Removal of standing water	217	54.25
Mosquito repellents	243	60.75
Cutting down bushes	198	49.50
Pouring chemicals in standing water	98	24.50
Management measures		
Plenty of rest	265	66.25
Drink plenty of water	208	52.00
Consult a physician	306	76.50
Is there a treatment for dengue	365	91.25

Multiple response

Table 3: Source of information for study subjects on dengue fever

Source of information	Yes	%
TV/Radio	356	89.00
School	234	58.50
Health workers	196	49.00
Mass meetings	269	67.25
Loud speaker	255	63.75
Brochures	108	27.00
Newspaper	336	84.00
Neighbors	234	58.50

Multiple response

Table 4: Attitude of respondents towards dengue fever

Variable	Number	Percent
Dengue is a serious illness?		
Strongly agree	243	60.75
Agree	121	30.25
Disagree	10	2.50
Strongly Disagree	5	1.25
Not sure	21	5.25
You are at risk of getting Dengue		
Strongly agree	78	19.50
Agree	67	16.75
Disagree	134	33.50
Strongly Disagree	23	5.75
Not sure	98	24.50
Dengue Fever can be prevented		
Strongly agree	99	24.75
Agree	110	27.50
Disagree	91	22.75
Strongly Disagree	23	5.75
Not sure	77	19.25

Table 5: Preventive practice against dengue fever among study participants.

Variable	Number	Percent
Preventing mosquito-man contact		
Use insecticide sprays to reduce mosquitoes	264	66.00
Use professional pest control to reduce mosquitoes	96	24.00
Use screen windows to reduce mosquitoes	122	30.50
Use fans to reduce mosquitoes	135	33.75
Use bed nets to reduce mosquitoes	107	26.75
Eliminate standing water around the house to reduce mosquitoes	117	29.25
Cut down bushes in the yard to reduce mosquitoes	112	28.00
Use mosquito coils to reduce mosquitoes	139	34.75
Does nothing to reduce mosquitoes	58	14.50
Eliminating mosquito breeding sites		
Covered water containers in the home	299	74.75
Frequently clean water	310	77.50

DISCUSSION

Our study intended to assess public knowledge, attitudes and practices related to dengue infection in Ujjain district, India. The knowledge of respondents was good with 57.5% of participants achieved at least 80% on the knowledge score. Most respondents were able to correctly relate to the symptoms of dengue with 77.75% of respondents to identify fever as symptom of dengue followed by 53.25% for vomiting, 41.25% for headache and 44.50 for rashes. Similar results were presented by Faisal et al[6] which revealed that 54.4% of participants achieved at least 80% on the knowledge score regarding dengue infection in Westmoreland, Jamaica. Similar KAP

studies conducted in Grenada[7] and Thailand[8] reported similar results. Fever was the most frequently recalled symptom in a similar study conducted in India.[9]The poor knowledge of the spectrum of symptoms associated with dengue means it may be confused with most other causes of fever such as the flu. The implication of this is that presentation to the clinic may be delayed until complications arise.

Knowledge of means of dengue transmission was good where approximately 71.25% of the participants were aware that the disease was transmitted by mosquito bite. However, it is noteworthy that 68.25% knew about water as mode for disease transmission. Gap in the knowledge was observed in the responses regarding breeding sites. People had very little idea that artificial water collections, tires/coolers, used bottles and bath tubs can also act as potential breeding sites. This is an important area to be addressed during community awareness campaigns.

Knowledge on various variables regarding preventive measures against diseases ranged from 94% for insecticide sprays to 62.5% for changing water regularly. More than half of the study population was aware of various preventive practices which could protect them from Dengue Fever. Contradictory results were found in study by Musarat[5] where half of the study population was unaware of such preventive practices. In a study in Thailand knowledge of this aspect was quite low[10].

Knowledge of management strategies for the disease was high among respondents. Though participants agreed they would get plenty of rest if they had dengue (66.25%) and drink lots of water (52%), it is possible that these are the usual remedies they would take if they were ill from any other disease. Respondents indicated that Radio and Television were the predominant sources of information regarding dengue. Secondly, only about half of participants obtained information about dengue disease from health workers. Thus, information, education and communication (IEC) intervention programs may need to be reviewed so that health workers can maximize the opportunity of clinic visits, to communicate effective ways of preventing dengue disease.

Regarding the respondents attitude, 91% had the attitude stating "dengue as serious illness". Similar findings were present in study conducted by Hairi, et al.[11] which revealed that 91.5% of the respondents had a good attitude toward dengue control. The similar findings are present in research conducted by Koenraadt, et al.[12] which revealed that almost all respondents (98%) regarded dengue as a serious problem in their village. Other supporting study is research conducted by Shuaib, et al. [13]

With regards to KAP scores, our findings suggest a good level of knowledge which does not commensurate with attitudes and practices directed at reducing the dengue infection prevalence. The literacy rate of 89.5% (based on use of completed primary education as a surrogate) is above the national average of 74.04% (census 2011). This is in consonance with findings in other studies where knowledge about dengue fever did not necessarily translate to positive attitudes and improved preventive measures.[8,14] Dengue disease prevalence can be reduced only by full community involvement which could only be gained by raising community's awareness on the topic.

Our findings must be interpreted in the light of several potential limitations. First being the fact that it is a cross-sectional survey which assesses relationships based on one point in time. Besides, it is possible that since the survey was interviewer based use of questionnaires, some participants would provide socially desirable responses to some questions[15]. However, since most residents in the catchment area use the clinics from which the respondents were sampled, the results have good external validity.

CONCLUSION

The study delineates the difference in the level of knowledge about the disease which does not commensurate with attitudes and practices directed at reducing the dengue infection prevalence. Dengue disease prevalence can be reduced only by full community involvement which could only be gained by raising community's awareness on the topic and the need to change the attitude and increase the preventive practice against dengue infection.

Source of Funding: Self

Conflict of Interest: Nil

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A Study of Compliance to Quality Monitoring Indicator in Cardiac PICU of a Tertiary Care Hospital with a View to Suggest Recommendations to Improve it

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ABSTRACT

The aim of this study was to understand the compliance of the quality monitoring indicator in the Cardiac PICU of a tertiary care hospital and to identify problems in the use of the set standardized methodology and to increase compliance..The WHO recommended five key moments when health care workers should practice hand hygiene; before patient contact, before an aseptic task, after body fluid exposure risk, after patient contact, and after contact with patient surroundings. This direct observational study mainly focused on the hand hygiene compliance of the various health workers involved in the care of patients of the Cardiac PICU. The hand hygiene opportunities of various healthcare workers were captured which included **Nurses, Doctors, Physiotherapists, and Technicians, Housekeeping staff, Visitors and others.**

The study was divided into two phases;

Silent Audit: during this phase the health care members of the PICU were not aware of the audit, they were under the impression that some other study was being undertaken. All the various healthcare members were closely observed during this phase.

Informed Audit: during this phase the health care members were briefed about the study going to be conducted and were told about the various parameters that would be observed for.

The overall hand hygiene compliance of the Cardiac PICU was 19% during the Silent Audit where as the compliance during the informed audit was 63.69%

Keywords*: Paediatric Intensive Care Unit (PICU), Hand Hygiene (HH), Compliance, Hospital Acquired Infection (HAI), Quality Improvement (QI),*

INTRODUCTION

It is estimated that one in ten patients admitted to a hospital will acquire an infection after admission, resulting in substantial morbidity and economic cost to the health care system. Patients with hospital acquired infection (HAIs) stay longer, require additional diagnostic and therapeutic procedure and are at increased risk of other medical complications. Approximately one third of HAIs are preventable with an effective infection control program.

The burden of health care-associated infection:

The epidemiological data and relevant issues related to the global burden of health care-associated infection (HCAI) emphasizes the importance of preventing HCAI by giving priority to the promotion of best practices of hand hygiene in health care.

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HCAI is a major problem for patient safety and it's surveillance and prevention must be a first priority for institution, committed to making health care safer. The impact of HCAI implies prolonged hospital stay, long-term disability, increased resistance of microorganisms to antimicrobials, massive additional financial burden, high costs for patients and their families, and excess deaths. Although the risk of acquiring HCAI is universal and pervades every health-care facility and system around the world, the global burden is unknown because of the difficulty of gathering reliable diagnostic data. Overall estimates indicate that more than 1.4 million patients worldwide in developed and developing countries are affected at any time [1]

The practice of hand hygiene has long been recognized as the most important way to reduce the transmission of pathogens in health care settings. Measuring adherence to hand hygiene practice is fundamental to demonstrating improvements both at an organization and a national level. Health care workers who come in contact with patients or the patients' environment, are expected to perform hand hygiene many more times throughout their encounter. These indications for hand hygiene are described in professional guidelines and policies. Within a single encounter with a patient, there can be several times when hand hygiene should be performed. Infections are frequently preventable through hand hygiene. [2]

Substantial epidemiologic evidence supports that hand hygiene reduces the transmission of healthcare-associated pathogens and the incidence of health-care associated infections. The link between hand hygiene and reduction in healthcare-associated infections are well known , in modern-day health care. The importance of hand hygiene is universally acknowledged by organizations such as the Joint Commission, World Health Organization (WHO) and Centers for Disease Control (CDC), which recommend or require hand hygiene practices and interventions to improve hand hygiene compliance, in order to reduce health care-acquired infections. This study will therefore focus on interventions to improve compliance with hand hygiene, rather than on the efficacy of hand hygiene for reducing healthcare-associated infections.

A direct observational study conducted at the Cardiac PICU of a tertiary hospital has provided insight to the hand hygiene compliance carried out, when there wasn't any physical presence of a infection control supervisor. The aim of the study was to understand the compliance rate of quality monitoring indicators of the infection control program in the Cardiac PICU and to recommend ways to improve compliance.

AIM

The aim of the study is to understand the compliance to hand hygiene practices amongst various health care workers involved in the care of pediatric patients in the Cardiac PICU in a tertiary care hospital, by the means of Hand hygiene audit and recommend suggestions to improve the compliance rate.

OBJECTIVES OF THE STUDY

To understand the set protocols of Hand hygiene.

- To make a checklist for encompassing the Hand hygiene parameters.
- To study the impact of hand hygiene adherence on reduction in the rate of hospital acquired infections.
- To assess the compliance of the 5 movements of Hand Hygiene set by WHO.
- To assess the Hand Hygiene Adherence of the Health care members of the Cardiac PICU during a Silent (uninformed) Audit.
- To assess the Hand Hygiene Adherence of the Health care members of the Cardiac PICU during an Informed Audit.
- To assess the variance in the Hand Hygiene Adherence of Health care members of the Cardiac PICU and educating them regarding the importance of Hand hygiene.
- To identify the parameter affecting the hand hygiene compliance.
- To recommend measure to improve the quality of hand hygiene in case of non compliance.

SCOPE OF THE STUDY

- Compare the evolution of compliance over time in the same institution.
- Perform a baseline measurement of compliance in an institution.
- Perform formal observations with immediate feedback to the observed HCW for training purposes.

- Establish the impact of system changes and multimodal interventions on compliance (before/after study)

REVIEW OF LITERATURE

The WHO has recommended five key moments when health care workers should practice hand hygiene; before patient contact, before an aseptic task, after body fluid exposure risk, after patient contact, and after contact with patient surroundings. [3]

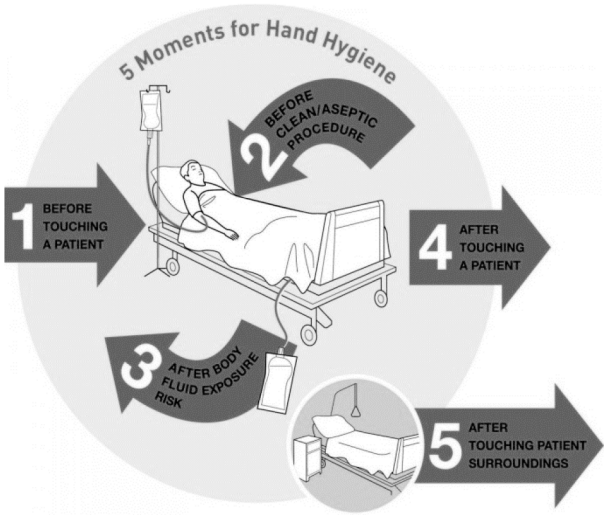
1. Before patient contact:

When? Before touching the patient

Why? To protect the patient from harmful germs carried on your hands.

2. Before clean/aseptic task

When? Clean your hands immediately before any clean or aseptic procedures**Why?** To protect the patient against harmful germs from entering his or her body



World Health Organization. WHO Guidelines for Hand Hygiene in Health Care. Geneva: World Health Organization; 2009.

3. After body fluid exposure:

When? Clean your hands immediately after an exposure to body fluids

Why? To protect yourself and the health care environment form harmful patient germs

4. After touching patient:

When? Clean your hands when leaving after touching the patient or after touching any object or furniture in the patient's environment.

Why? To protect yourself and the spread of harmful germs from the patient

5. After touching patient surroundings:

When? Clean your hands after touching any object or furniture's in patient's immediate surroundings, when leaving even if the patient has not been touched.

Why? To protect yourself and the healthcare environment from harmful patient germs

Interventional study to evaluate the impact of an alcohol-based hand gel in improving hand hygiene. [4]

To evaluate the effects of the introduction of an alcohol-based hand gel and multifaceted quality improvement (QI) interventions on hand hygiene (HH) compliance.

Interventional, randomized cohort study with four study phases (baseline; limited intervention in two units; full intervention in three units; washout phase), performed in three intensive care units at a pediatric referral hospital. During 724 thirty-minute daytime monitoring sessions, a number of identified observers witnessed 12 216 opportunities for HH and recorded compliance.

Baseline compliance decreased after the first 2 weeks of observation from 42.5% to 28.2% (presumably because of waning of a Hawthorne effect), further decreased to 23.3% in the limited intervention phase and increased to 35.1% after the introduction of a hand gel with QI support in all three units ($P < 0.001$). The rise in compliance persisted in the last phase (compliance, 37.2%); however, a gradual decline was observed during the final weeks. Except for the limited intervention phase, compliance achieved through standard hand washing and glove use remained stable around 20 and 10%, respectively, whereas compliance achieved through gel use increased to 8% ($P < 0.001$). After adjusting for confounding, implementation of the hand gel with QI support remained significantly associated with compliance (odds ratio, 1.6; 95% confidence interval, 1.4 to 1.8). In a final survey completed by 62 staff members, satisfaction with the hand gel was modest (45%).

They noted a statistically significant, modest improvement in compliance after introduction of an alcohol-based hand gel with multifaceted QI support;

appropriately implemented alcohol-based Hand Hygiene may be effective in improving compliance.

MATERIAL & METHOD

Study setting*:* Study was conducted in the Cardiac PICU of a 250 bedded Tertiary care hospital situated in Mumbai. The Cardiac PICU was a 9 bedded unit.

Study design: It was a direct observational study which was done in two phases for collecting data for Hand hygiene compliance. The study was conducted over a span of 3 weeks of which 1 week was to understand the protocols for Hand hygiene, 2 weeks for data collection for Hand hygiene compliance.

Data collection:

TOOLS OF DATA COLLECTION

A customized observational checklist was prepared in order to capture hand hygiene opportunities

Data was collected by observing the health care workers involved in the care of the patients in the cardiac PICU.

- Project is based on primary data collection wherein the hand hygiene opportunities of various healthcare workers was to be captured using a checklist; healthcare members included Nurses, Doctors, Physiotherapists, Technicians, Housekeeping, Visitors and others.
- Approximately 300 opportunities were captured per day

The data was collected in two phases

Silent (uninformed) Audit: during this phase the health care members of the PICU were not aware of the audit, they were under the impression of another study was being undertaken. All the various healthcare members were closely observed during this phase

Informed Audit: during this phase the health care members were briefed about the study going to be conducted and were told about the various parameters that would be observed for. Direct observation was done to collect and capture the opportunities.

OBSERVATIONS & DISCUSSION

In the Silent Audit phase 1739 opportunities were captured and during the informed audit phase 1716 were captured and then analyzed. All the healthcare members were observed. It was observed that the maximum opportunities were captured from the nurses since they were in contact with the patient most of the times. The observation made was that the healthcare workers were doing the hand hygiene at instances like before touching patient but could touch various areas of patient's environment before finally touching the patient which is then considered as non compliant.

During the silent audit phase were in the healthcare workers weren't aware of the audit being conducted, the Hand hygiene compliance of the entire unit was 19.26%. The compliance by Nurse, Doctors, Physiotherapist, Technicians, Housekeeping and others (visitors) were 17.85%, 17.64%, 29.46%, 0%, 36.36% and 69.56% respectively.

During the informed audit phase the healthcare workers were aware of the audit being conducted and the Hand hygiene compliance of the entire unit was 63.69%. The compliance by Nurse, Doctors, Physiotherapist, Technicians, Housekeeping and others (visitors) were 64.07%, 53.81%, 81.39%, 22.22%, 46.42% and 69.38% respectively.

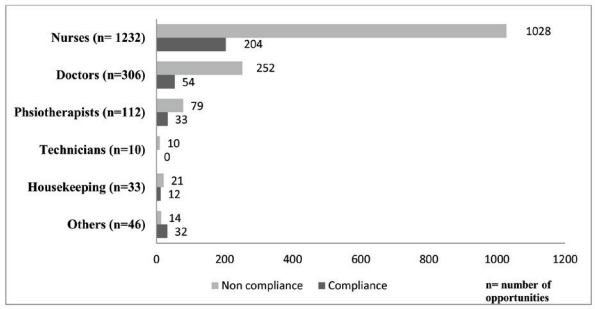


Fig 1: Compliance rate to Hand hygiene by various Healthcare workers in the Cardiac PICU during the SILENT AUDIT

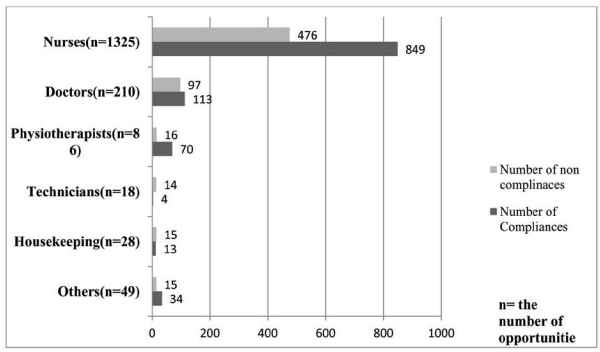


Fig 2: Compliance to Hand hygiene by various Healthcare members of Cardiac PICU during the INFORMED AUDIT

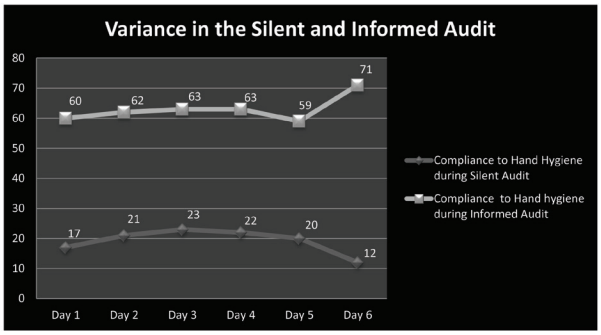


Fig 3: Variance in both the rate of compliance to hand hygiene during the two phases

RECOMMENDATIONS

- Reminder alarm system hourly for constant reminders to the healthcare workers
- Close monitoring by the In-charge, maintaining chits for mentioning the name of the defaulters and reviewing it at the end of the month
- Assigning one particular staff to ensure hand rub is done by everyone before handling OT transfer ins
- Strict barrier system to be practiced for CHEST OPEN patients as well as isolation patients
- Moments like Before touching the patient and After touching the patient needs primary focus for improvement in compliance
- Education and training and Strict Induction Program before joining the clinical
- Routine observation and feedback
- Patient relative education
- Administrative sanctions and rewards
- Change in hand-hygiene agent (but not in the winter)
- Promote and facilitate healthcare worker hands' skin care
- Obtain active participation at individual and institutional level
- Maintain an institutional safety climate
- Enhance individual and institutional self-efficacy
- Avoid overcrowding, understaffing, and excessive workload
- Celebrate Hand hygiene Week in order to bring awareness amongst the staffs

CONCLUSION

Although the Hand hygiene procedure is simple, Hand hygiene compliance among Health Care Workers is so low that it cannot be easily explained or changed which may be influenced by the fact that there is lack of motivation and increased workload may be the two causes of poor compliance. In the present study, the highest compliance rates were during the informed audit phase.

Avoidable harm continues to occur to patients receiving health care, because of the unreliable systems and strategies that militate the optimal hand hygiene compliance. As part of the continued global effort to ensure that no patient is unavoidably harmed through lack of compliance with hand hygiene, consideration should be given to nationally-coordinated programs (in some cases campaigns) to promote and sustain hand hygiene improvement, keeping the issue in the national spotlight and ensuring effective implementation of guidelines that have an impact on hand hygiene at the bedside.

Health campaigns can have some effects on health knowledge, beliefs, attitudes, and behavior. The existence of guidelines, do not in them self improve hand hygiene compliance. Therefore, the added impetus provided by a nationally coordinated campaign or program, with some form of monitoring and evaluation, targets and regulation, has been demonstrated to provide a powerful adjunct to local implementation. In particular, to raise awareness of the issue and elevate it to a level of prominence that might not be realized in the absence of a nationally coordinated activity. For hand hygiene improvements to succeed within an integrated safety and infection control agenda, national-level approaches should be considered.

Conflict of Interest- We certify that there is no conflict of interest.

Source of Funding- The study has not been funded by any agency.

Ethical Clearance- The study has been conducted as a part of Summer Internship of MBA (Hospital & Healthcare Management) students, to study the Administrative & Managerial issues of the hospital; there was no direct contact with the patients, any intervention in any form of the care of the patients and hence there

were no Ethical issues involved.

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Oxidant and Antioxidant Status and Uric acid in Hyper Tension, Diabetes Mellitus and Metabolic Syndrome

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ABSTRACT

Diabetes represents a major public health burden, both locally and globally. From 1985 to 2000, the number of people living with diabetes globally rose from 30 million to 171 million. Future projections have estimated the prevalence of diabetes to exceed 300 million cases by 2030, with the majority of growth occurring in developing countries. Free radicals are highly reactive molecules generated by biochemical redox reactions that occur as part of normal cell metabolism and in the course of free radical mediated diseases such as arthritis, renal, cardiovascular, inflammatory, infectious, neurological diseases, diabetes mellitus and cancer. An antioxidant is a molecule capable of slowing (or) preventing the oxidation of other molecules. Early research on the role of anti oxidants in biology of focused on their use in preventing the oxidation of unsaturated fats, which is the cause of rancidity. The production of this aldehyde is used as a biomarker to measure the levels of oxidative stress in an organize.Malondialdehyde mainly exists in the enol form. A substantial portion of the population of the United States has the Metabolic Syndrome, a condition that greatly increases risk for cardiovascular disease and diabetes. Insulin resistance, and the resulting compensatory hyperinsulinemia, is the principal pathophysiologic abnormality underlying the majority of these cases. Different physiological processes associated with various components of the metabolic syndrome contain unique information about diabetes risk.Microalbunuria is more likely to be a complication of the type 2 diabetes or hypertension than amarker of the metabolic syndrome.Moreover, easily applicable testing to diagnose insulin resistance accurately in the general population is currently not feasible. It is therefore necessary to broaden the criteria that define the metabolic syndrome to include other conditions associated with the presence of insulin resistance. Such conditions include the following: a family history of type 2 diabetes or coronary artery disease in first- or second-degree relatives, signs of an over active sympathetic nervous system, and elevated concentrations of uric acid. By recognizing these "other conditions," appropriate lifestyle changes and medication can be recommended to help prevent cardiovascular disease and diabetes from developing in these high risk patients.

Keywords: *Diabetes Mellitus;Antioxidant;Uric acid;Metabolic Syndrome.*

INTRODUCTION

Diabetes represents a major public health burden, both locally and globally. From 1985 to 2000, the number of people living with diabetes globally rose from 30 million to 171 million. Future projections have estimated the prevalence of diabetes to exceed 300 million cases by 2030, with the majority of growth occurring in developing countries. It is well known that diabetes is associated with significant morbidity and mortality. For these reasons considerable resources have been invested to improve diabetes management1.Diabetes is not one disease, but rather is a heterogeneous group of syndromes2 characterized by hyperglycemia due to absolute (or) relative deficiency of insulin3. Diabetes mellitus (DM) is also characterized with disturbance

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of carbohydrate, fat, and protein metabolism, resulting from defects in insulin secretion, insulin action (or) both. When the effects of DM include long term damage, dysfunction and failure of various organs, especially the eyes, kidneys, heart and blood vessels. DM may present with characteristic symptoms such as thirst, polyuria, blurring of vision, weight loss, and polyphagia, in its most severe forms with ketoacidosis (or), nonketotic hyperosmolarity, which in the absence of effective treatment leads to stupor coma and death4.Free radicals are the chemical species (molecules (or) molecular fragments) that possess one (or) more unpaired electrons and have an independent existence. Conventionally. Biological oxidations ensure that molecular oxygen is completely reduced to water. However, partial reduction of O2 generates reactive oxygen species (ROS) which are more commonly referred to as free radicals5.

Free radicals are highly reactive molecules generated by biochemical redox reactions that occur as part of normal cell metabolism and in the course of free radical mediated diseases such as arthritis, renal, cardiovascular, inflammatory, infectious, neurological diseases, diabetes mellitus and cancer 6

Reactive oxygen species degrade polyunsaturated lipids, forming malondialdehyde7. This compound is a reactive aldehyde and is one of the many reactive electrophile species that cause toxic stress in cells and form advanced glycation end products8. The production of this aldehyde is used as a biomarker to measure the levels of oxidative stress in an organize9-10. Malondialdehyde mainly exists in the enol form11.MDA and other "thiobarbituric reactive substances" (TBARS) condense with two equivalents of thiobarbituric and acid to give a fluorescent red derivative that can be assayed spectrophotometrically11-12 1-Methyl-2-phenyl indole is an alternative more selective antigen. An antioxidant is a molecule capable of slowing (or) preventing the oxidation of other molecules. Early research on the role of anti oxidants in biology of focused on their use in preventing the oxidation of unsaturated fats, which is the cause of rancidity13.The possible mechanism of action of an oxidants were first explored when it was recognized that a substrate with anti-oxidative activity is likely to be one that is itself readily oxidized14. Often by scavenging reactive oxygen species before they can damage cells15. However, it was the identification of vitamin A, C and E as antioxidants that revolutionized the field and led to the realization of the importance of16-17 antioxidants in the biochemistry of living organisms. There are truly the scavengers of free radicals. The most important antioxidant enzymes are superoxide dismutase, catalase and glutathione peroxidase. Vitamin C (ascorbic acid),VitaminE (tocopherol), BetaCarotene, Uricacid, Glutathione, Flavonoids, Ceruloplasmin, Caffeine,Ferritin, Transferrin, Bilirubin. The clustering of hypertension, dyslipidemia, glucose intolerance, insulin resistance, hyperinsulinemia,microalbuminuria, and obesity, particularly central obesity has been termed the metabolic syndrome1. Controversies still exist as to whether microalbuminuria is a component of the syndrome2– 4.An important feature of the syndrome is insulin resistance, which is characterized by increased serum fasting insulin levels among nondiabetic individuals in epidemiological studie5-6 Thus, it has been called syndrome X or insulin resistance syndrome7-8. Despite that the underlying mechanism of the syndrome is not completely understood, obesity and sedentary lifestyle coupled with unbalanced diet and still largely unknown genetic factors interact to produce the syndrome9-10. It has been proposed that this syndrome is a powerful determinant of type 2diabetes and cardiovascular disease7-11. Recently, factor analysis, a statistical technique for studies including interrelating variables, has been applied to investigate the risk factor clustering in the metabolic syndrome12–17 and to predict coronary heart disease or total and cardiovascular disease mortality.However, little information is currently available on the mechanism with which the major components of the metabolic syndrome, including urinary albumin excretion rate (UAER), relate to each other in nondiabetic and diabetic individuals.

urthermore, there are only few prospective studies evaluating the extent to which the metabolic syndrome or its individual components predict the development of type 2 diabetes. Therefore, some studies are applied factor analysis to investigate how the major components of the metabolic syndrome relate to each other and to the developmentof diabetes in a Chinese population. Our aim is to comparing the findings in women and men and in nondiabeticand diabetic participants separately. Discussion and Conclusion:

In Factor analysis one study findings revealed consistent clusters of variables that were different in nondiabetic and diabetic subjects in the Chinese population. Blood pressure was not linked with insulin resistance. Obesity and glucose/insulin factor were the

strongest predictors of type 2 diabetes. These findings suggest that insulin resistance is not the single unifying factor for the clustering of the components of the metabolic syndrome. Different physiological processes associated with various components of the metabolic syndrome contain unique information about diabetes risk8-10. Microalbunuria is more likely to be a complication of the type 2 diabetes or hypertension than amarker of the metabolic syndrome.MS patients at the stage of DGT demonstrate intensified LPO, elevated concentration of the end metabolites NO-nitrates and conditions for endotheliocytes desquamation. These processes promote early development of angiopathy in DM. DGT are reversible, therefore, these MS patients are perspective for prophylaxis. The presence of oxidant stress in such patients should be consider in prescription of relevant medication.Plasma levels of TG most significantly reflect severity of basic clinical manifestations of MS: abdominal obesity, arterial hypertension, CM compensation. The presence of hypertriglyceridemia in MS patients can be considered as an indicator of high atherogenic potential of plasma10-12.

The WHO criteria appear to identify a greater number of obese adults at risk for CVD. Nevertheless, the addition of an OGTT at least in nondiabetic patients with two ATPIII-defined metabolic risk factors may help to improve the association between the MS and CVD in obese adults.A substantial portion of the population of the United States has the Metabolic Syndrome, a condition that greatly increases risk for cardiovascular disease and diabetes14-16. Insulin resistance, and the resulting compensatory hyperinsulinemia, is the principal pathophysiologic abnormality underlying the majority of these cases. Based on the most recent recommendations of the National Cholesterol Education Panel, such patients can be identified by the presence of three or more of the following traits: impaired fasting glucose, abdominal obesity, hypertension, elevated levels of triglycerides, and low concentrations of HDL-cholesterol. However, a significant number of insulin resistant (and thus high risk) individuals will not be identified using these criteria17. This discrepancy occurs because insulin resistance is a continuous variable, without an absolute cut-off between normal and abnormal, and those fitting the definition are the most insulin resistant. Moreover, easily applicable testing to diagnose insulin resistance accurately in the general population is currently not feasible. It is therefore necessary to broaden the criteria that define the metabolic syndrome to include other conditions associated with the presence of insulin resistance. Such conditions include the following: a family history of type 2 diabetes or coronary artery disease in first- or second-degree relatives, signs of an over active sympathetic nervous system, and elevated concentrations of uric acid. By recognizing these "other conditions," appropriate lifestyle changes and medication can be recommended to help prevent cardiovascular disease and diabetes from developing in these high risk patients.In our india MS,a condition that greatly increases risk for cardio vascular disease and diabetes.In our study findings are also related to this review(Author) findings.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance No.- No.IEC/C-P/031/2016

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An Analysis of Risk Management in the Process of Inspection Activities in the Port Health Office (PHO) Class I Surabaya

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ABSTRACT

The high number of accidents is merely caused by the dysfunction of the OSH management. One of the efforts to decrease the number of accidents is by applying HSMS through the implementation of risk management. Based on the observation and interview events almost wretched is often the case, one of them slipped due to slippery floor of the boat . In July 2015, there was an accident that killed the officer of Port Health Office due to collisions of speedboat in South Kalimantan. Several incidents above show that the process of inspection of the vessel is very risky to work accidents. Therefore, risk management is required.

This study was a descriptive study that was conducted in March-June 2017. The aim was to analyze the safety risk management on inspector job of ships in Port Health Office Class 1 Surabaya. The standard used is AS/ NZS 4360: 2004. This research was a semi quantitative research design with *cross sectional* and observational research. The object of this study was the hazard and the risk of OSH contained in the ship inspection activities. Technique of data collection was done by using observations, interviews and FGD.

The results of the risk assessment shows 41% low risk and 59% medium risk and high hazard risk level is not found. Because there are several control which already exist and have been carried out, such as the availability of PPE is complete, the SOP of work, the measurement of the quality of the working environment and implementation of training. Meanwhile, a system for recording and reporting occupational accidents have not been implemented. Therefore, need to make an organization dealing with OSH and create a system for recording and reporting occupational accidents in which all incidents of workplace accidents can be recognized and controlled quickly and precisely.

Keywords: *Risk Management, Work Accident of Port Health Office (PHO), Ships Inspector.*

INTRODUCTION

Port Health Office (PHO) is a unit of organization in charge of implementing the prevention of entrance and exit of the disease, a potential disease outbreaks, epidemiological surveillance, quarantine, control of environmental health impacts. Health services, medication monitoring medical devices and cosmetics food addictive substances (OMKABA) as well as safeguards against re-emerging diseases, bioterrorism, elements of biology, chemistry and security radiation of working area ports and land border state[1], Many potential hazards and risks that can be generated OSH. Therefore need a way to prevent or control to prevent and reduce occupational accidents in accordance with the Indonesian Government Regulation No. 50 year 2012 on the implementation of Health and Safety Management System (HSMS) as a way to prevent workplace accidents[2], Beside that, the Minister of Manpower At No.05/ Men/ 1996 requires the existence of risk management in the workplace[3].

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Data Social Security Agency (BPJS) Employment mentions the figure of occupational accidents in Indonesia is still high. Until the end of 2015, there were 105 182 work accidents cases happen. The number of workplace accidents in Indonesia each year increased up to 5%[4], The main cause of accidents is that there is still low awareness of the importance of risk management in the industry since HSMS is consider as a cost or expense, rather than as an investment to prevent accidents.

The implementation of risk management on Health and Safety Management System (HSMS) aims to help the management to prevent losses to be happen through risk management accurately. In the risk management, risk assessment is very influential in determining the effect or exposure of potential hazard, since through a risk assessment, occupational accident can be prevented or eliminated. Risk management is the core management of higher system of OSH which requires the existence of risk management[5], An organization that implement any risk management methods which therefore having the methods to identify, evaluate and prioritize risks and control the risk by short-term and long term approach[6].

Results of interviews to ship inspectors found that the incidence of almost wretched (Near Miss) is often the case, one of them slipped due to slippery floor of the boat and sandwiched between two of the ship when crossing. In July 2015, there was an accident that killed the officer of Port Health office due to collisions speedboat and small boat in South Kalimantan Kotabaru. The accident occurred when the officer is heading to the ship to conduct inspection of ships. However, about 100 meters from the harbor there was small boat that want to advance in the direction of a speedboat, because it was blocked by a wooden barge (place to sell oil at sea), speedboat ended up colliding with a wooden raft. Information obtained from field officers, officers were killed due to hit the edge of the speedboat. Before the strike, the victim was hit by a speedboat carrying raft, after collision, speed boat struck a barge mooring oil selling wood not far from Port Office Kotabaru[7],

Accidents above are one hazard that can occur when performing inspection of ships. Often overlooked risk management implementation and assume that all hazards have been addressed and there were no serious accidents remarks. The risk management process should be implemented fully in the workplace, and repeated periodically to ensure that all hazards have been identified. The risks have been assessed in adequate measures to control the risks in the workplace. Risk management program is a management responsibility, while the worker role is one of support and assistance in the implementation and application of risk management in the workplace.

Some of the previously mentioned exposure indicated that the implementation of risk management in the workplace indirectly prevent and reduce accidents, prevent and control the incidence of occupational diseases. The end result of the implementation of risk management are increasing productivity, improving morale and relationship relations or relations company for the better.

This study aims toanayze the safety riskanagement (risk identification, risk analysis, risk evaluation, risk control) on work inspection of ships in Port Health Office Class 1 Surabaya.

MATERIAL AND METHOD

This research is descriptive observational approach *cross sectional.* The research was conducted in March - June 2017 at Port Health Office (PHO) class I Suabaya. This study was included in the semi-quantitative research, The object of this study was the hazard and risk of OSH contained in the process of ship inspection activities. Technique of data collection was done by using observations, interviews and FGD (focus group discussions). Interviews and FGDs conducted the inspection of ships employee. The number of employees who are interviewed and Include in the FGD process were 13 people (Permanent Employee and temporary employees). The standards used in assessing the risk in the risk management was by using the New Zealand Standard (AS / NZS 4360: 2004).

Natural hazard identification and risk OSH, the method used is a Task Risk Assessment (TRA). In addition the method is also used in performing risk analysis OSH at a stage of the work process to determine the level of risk by calculating the consequences of OSH, the likelihood and frequency of exposure of each risk. The data collected in the process of this research is primary data and secondary data. The primary data obtained through observation, interviews and focus group discussions on workers in order to get an overview of hazard and risk identification and control OSH (Exsiting control) has been done by the Port Health

Office in preventing the occurrence of an event. While secondary data obtained from documents on the Port Health Office Class 1 of Tanjung Perak Office Surabaya.

FINDING

The process of ship inspector jobs in The Port Health Office Class I Surabaya is conducted from a trip to the dock (1), enters the dock area (2), boarding (3), conduct inspection of the vessel (ship sanitation inspection, health inspection and (4) Down the ship (5), and a journey to the port health office (6)[8]. Activities of risk identification is the first step in risk management that aims to determine the safety problem exists in the process of work. All activities are performed in each process of work performed has a wide variety of potential safety hazards. Results of those hazards identification then analyzed to determine the amount of risk and the level of risk, and whether those risks are acceptable or not. To find and determine the level of risk through a risk assessment by determining the value of likelihood, the value of the exposure, the value of the consequences[9], The risk assessment in terms of likelihood seen from the behavior of officers in work and the work environment, in terms of exposure views of how long exposure to either chemical, biological and physical while doing inspection of ships as well as the travel time officer to get to the ship and to ports as well as in terms of the consequences seen from the consequences that may result from an incident/ accident.

All risks are identified and assessed by using the category level of risk of high, moderate, and low. The process of identifying up to risk assessment using Task Risk Assessment (TRA)[10], The results of the risk assessment is used as a basis for determining risk control alternatives.

Table 1. Results of risk identification and risk assessment on work inspection of ships in Port Heath Office Class I Surabaya

Potential hazard	Ship Inspection activities					
	1	2	3	4	5	6
	The journey to the dock	Entering the pier Territory	Boarding ship	Ship inspection	descend Ship	Journey Into Office
Nudge	M	M			M	M
Crash	L	L			L	L
The Fall Containers		M			M	
fall overboard			M		M	
Stair stumble			L		L	
slip			M	L	M	
sandwiched between 2 Ships			M			
Crushed Food Shelves				L		
Scratched Sharps				L		
Toxicity of Chemicals				M		
Virus/ disease				M		

Information :

M	Medium Risk
L	Low Risk

Based on the results of the identification and assessment of risks of inspector job of ship in The Port Health Office Class I Surabaya showed that the average stage of his work in the category of low/ acceptable. Prevention also needs to be done even though the ship inspection activity was found into the category of low risk/ acceptable. The level of low and medium risk was found not to be high risk and could endanger workers. Control to prevent accidents from happening is to always wear PPE complete, perform safety talk before working

its purpose is to remind employees/ workers will be potential hazards in the workplace in order to establish safe behavior at work and help employees/ workers to identify and control hazards, in addition to the CTF parties also need to conduct surveillance, monitoring and evaluation in order to determine all the input data or information obtained from these observations can form the basis for making decisions further action is necessary. Such action is necessary if the observations indicate the presence or condition of things that do not fit.

The process of supervision, monitoring and evaluation should be accompanied by a system of recording and reporting of workplace accidents to be used as guidelines in conducting the investigation and reporting of occupational accidents and can determine the factors causes of accidents and to prevent similar accidents from happening again.

CONCLUSION

Hazard identification process carried out on the ship inspector job in Port Health Office Class I Surabaya produced 22 hazards.

Levels of risk found are a medium-risk and low-risk levels, whereas there is no danger or high level found.

Control needs to be done in order to prevent all high risk with administrative controls (Safety Talk, supervision, monitoring and evaluation, as well as the recording and reporting of workplace accidents) and the use of PPE.

Conflict of Interest: None

Source of Funding: Department of Occupational Health and Safety, Airlangga University, Surabaya, Indonesia

Ethical Clearance: The study was approved by the ethical committee of Airlangga University

All subjects were fully informed about the procedures and objectives of this study and each subject prior to the study signed an informed consent form.

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Comparative Study of Nitric Oxide Levels in Metabolic Syndrome and Diabetes Mellitus Patients

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ABSTRACT

The metabolic syndrome is a clustering of risk factors of metabolic origin that increase the risk for cardiovascular disease and type 2 diabetes (DM). A proposed central event in metabolic syndrome is a decrease in the amount of bioavailable nitric oxide (NO) from endothelial NO synthase (eNOS). Patients with diabetes invariably show an impairment of endothelium-dependent vasodilation. Our aim is to evaluate the endothelial dysfunction in metabolic syndrome & Diabetes patients by estimation of nitric oxide levels. The study was conducted at SLIMS, Puducherry. The study included 200 diabetic patients, 200 metabolic syndrome patients and 200 Controls. When compared to controls, It was found a significant increase ($p<0.001$) in nitric oxide among metabolic syndrome and diabetes group and significant difference ($p<0.001$) between diabetes mellitus and metabolic syndrome groups being higher in metabolic syndrome group. Nitric oxide is reduced in the course of vascular disease in diabetes mellitus. Increased production of superioxide anion on oxidative stress to reduce plasma nitric oxide levels.

Keywords: *Niric oxide, Diabetes mellitus, Metabolic syndrome, Cardiovascular disorders.*

INTRODUCTION

The metabolic syndrome (MetS) is considered as the most important public health threat of the 21st century, affecting between 10 & 15% of adult populations worldwide. This syndrome is characterized by a cluster of cardiovascular (CV) risk factors including central abdominal obesity, elevated triglycerides, reduced HDL cholesterol, high blood pressure, increased fasting glucose and hyper insulinemia[1].

Diabetes occurs a decade earlier in Asian population. India has a large and growing population of diabetic patients; its prevalence will reach 350 million by 2025. Diabetes is associated with increased risk for CVD, stroke and other risk factors of metabolic syndrome[2].

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Diabetic mellitus (DM) is a group of metabolic disorder that shares the phenotype of hyperglycemia. Which defects due to reduced insulin secretion, decreased glucose utilization and increased glucose production. Chronic hyperglycemia of diabetics is associated with long term damage, dysfunction, retinopathy, nephropathy and neuropathy. It also predisposes to cardiovascular diseases. DM will be leading cause of morbidity and mortality for the foreseeable future. Majority of the diabetic cases cauterized into type I and type II. Type I (insulin dependent) Type II (insulin independent) because of autosomal immune destruction of β cells of pancreas with consequent insulin deficiency. Additional factors found to increase the risk of Type II DM include aging, high-fat diets, and a less active lifestyle.

Free radical nitric oxide (NO) has emerged as a fundamental signaling device regulating virtually every critical cellular function and is a potent mediator of cellular damage in many conditions[3]. Endothelium plays a pivotal role in the regulation of vascular tone, controlling tissue blood flow and inflammatory responses and maintaining blood fluidity. These cell

produced by vasodilatory substances such as NO. The MetS components, dyslipidaemia, hypertension and type II diabetes are well known CV risk factors and are all associated with impaired endothelial function[4]. The mechanism by which these risk factors induce endothelial dysfunction. Hyperglycemia may interfere with endothelial function and the NO pathway causing glycation of elastic fibers and failure in smooth muscle relaxation, decrease in NO production (due to a decreased expression of endothelial NO synthase or reduced bioavailability of its cofactor), increase in NO deactivation, and increase in the NO synthase inhibitor[5]. Hyperglycemia may additionally impair endothelial function by promoting release of free radicals, such as superoxide, which inactivates NO resulting in the production of peroxyinitrite, a potent oxidant that stimulates the production of vasoconstrictor prostanoids

OBJECTIVE OF THE STUDY

Our aim is to evaluate the endothelial dysfunction in Metabolic syndrome& Diabetes patients by estimation of nitric oxide levels. CRP, Oxi LDL.

MATERIALS AND METHOD

The study was conducted at SLIMS, Puducherry. The study included 200 diabetic patients, 200 MetS patients and 200 Controls. The study was approved by the institutional ethical committee of Sri Lakhsmi Naryana Institute of Medical Sciences, Puducherry according Helsiniki 1975 human ethical guidelines. All the data were collected in a prescribed perform and obtained informed consent form from studied subjects. Nitricoxide were estimated by Kinetic cadmium reaction. FBS, lipid profile assessed by using standard method using commercial kits. 5 ml of venous blood samples were collected from patients and controls and these samples were collected overnight fasting of 12 hrs. Collected samples centrifuged under 2000 rpm for 20 min and after centrifugation of samples (plasma) used to assess the Nitiricoxide levels.

The diagnosis of diabetes mellitus was based on World Health Organization (WHO) criteria,i.e. a fasting blood glucose (FBG) of 110mg/dL after a minimum 12-hour fast, with symptoms and family history of diabetes.

The diagnosis of Metabolic syndrome was based waist, BMI, waist-hip ratio, systolic and diastolic blood pressure, Blood glucose levels.

NCEP ATP III 2001 CRITERIA FOR METABOLIC SYNDROME: The purpose of ATP III was to identify people at higher long-term risk for cardiovascular diseases (CVDs) who deserved clinical lifestyle intervention to reduce risk. Presence of three of the following five factors is required for diagnosis of metabolic syndrome[6].

Central obesity: Abdominal waist circumference: Men >102 cm, women >88 cm. Fasting plasma glucose >110 mg/dl or diagnosed type 2 diabetes mellitus (T2DM). Fasting plasma triglyceride >150 mg/dl or medication. Fasting plasma HDL cholesterol: Men <40 mg/dl, women <50 mg/dl or medication. Blood pressure ≥120/80 m m Hg or medication

STATISTICAL ANALYSIS

All results were summarized as mean ± SEM. The statistical analysis was done using SPSS 11.5 (SPSS, Inc.,Chicago)., and the comparison between patients and control was done by using Anova. A P-value less than 0.05 were considered statistically significant.The statistical significance was kept of P value <0.001 is comparatively highly significant.

RESULTS AND DISCUSSION

Table.No. Endothelial dysfunction in Metabolic syndrome and Diabetes mellitus patients

S.No.	Parameters	MetS(n-200) Mean± SEM	DM(n-200) Mean± SEM	Controls(n-200) Mean±SEM	p Value
1	Nitric oxide(NO) (µmol/lit)	86.6±7.42	82.8±6.72	68.2±5.93	p<0.001
2	FBS(mg/dl)	156.55±4.82	168.55±4.92	106.12±1.68	p<0.001
3	Cholesterol (mg/dl)	245± 30.51	263± 32.62	188.5 ±27.3	p<0.001
4	TGL (mg/dl)	243±28.62	258±31.02	169.2±28.4	P<0.001
5	HDL (mg/dl)	30± 5.52	36± 6.23	50± 8.25	p<0.001
6	LDL (mg/dl)	123.8±31.4	126.2±30.1	68.3±13.2	P<0.002

Endothelial cells secrete different mediators such as vasodilators i.e.,NO, and vasoconstrictors i.e., endothelin-1. Hyperglycaemia and other metabolic changes may lead to impairment of NO production .When compared to controls, It was found a significant increase ($p<0.001$) in nitric oxide among MetS and diabetes group and significant difference ($p<0.001$) between DM and MetS groups being higher in MetS group. This finding suggests that affects pressure and flow patterns, increasing peripheral vascular resistance and decreasing sensibility for insulin-mediated glucose disposal, contributing to hypertension and insulin resistance in MetS. FBS, lipid profile significantly increased in the studied subjects such that DM($p<0.05$) and MetS ($p<0.05$) were observed, when compared with control group. Increase FBS, lipid profile were observed, when compared with MetS group. FBS, lipid profile were done to identify the DM, MetS patients.

NO plays a crucial role in the pathogeneses of MS components and it is involved in different mitochondrial signaling pathways that control respiration and apoptosis. Changes in the activities of different NO synthase isoforms may lead to the formation of metabolic disorders[7].

In patients with MetS, responses to intra brachial acetylcholine were attenuated with no difference between normotensive and hypertensive groups. NO level correlates with, systolic blood pressure and triglycerides in these patients. Studies indicate that vasodilatation, does not increase muscle glucose uptake. However, when vasodilatation occurs concomitantly with the recruitment of new capillary beds, as brought about by insulin, muscle glucose uptake is enhanced[8.] In the same way that insulin resistance may contribute to endothelial dysfunction, defects in NO-mediated vasodilation may contribute to insulin resistance

In obese Zucker rats, an animal model of the metabolic syndrome, reduced endothelium-mediated dilation was associated with decreased NO bioavailability and excessive superoxide production[9].

Endothelial dysfunction is a common problem in all diabetic patients. It is the early feature of cardiovascular complications in Type II DM.A significant increase in NO level was found in diabetes when compared to control ($p<0.001$).due to vascular injury in diabetes consequential from hyperglycemia has been associated with oxidative stress that leads to depletion of intracellular glutathione with an augmented plasma extracellular superoxide dismutase which intervenes lipid peroxidation and diabetic complications[10].

Elevated concentration of superoxide dismutase causes impairment of endothelial isoform of nitric oxide synthase (eNOS) by triggering advanced glycation end products and poly polymerase (ADPribose). NO is synthesized as a byproduct of conversion of its physiological precursor L-arginine to L-citrulline. This reaction is catalyzed by a family of enzymes known as NO synthase (NOS)[11-14.]

NO is produced in endothelial cells from the substrate L-arginine via eNOS. Elevated asymmetric dimethyl arginine levels cause eNOS uncoupling, a mechanism which leads to decreased NO bioavailability. The endothelial dysfunction associated with diabetes has been attributed to lack of bioavailable NO due to reduced ability to synthesize NO from L-arginine. New basic research insights provide possible mechanisms underlying the impaired NO bioavailability in type II diabetes. So, the NO is reduced in the course of vascular disease (e.g., diabetes and hypertension)[15-19.]

Deficiency of NO, increases vascular resistance and promotes atherogenesis. In addition to its increased oxidative degradation, another possible mechanism for NO deficiency and cardiovascular morbidity is reduced NO synthesis caused by asymmetric dimethylarginine (ADMA).[20-21]

Thus, a deeper understanding of the role of NO is necessary for the study of MetS,DM pathogenesis as well as its complications and clinical applications.

CONCLUSION

To sum up, serum NO was observed a significant increase ($p<0.001$) in nitric oxide among MetS and diabetes group and significant difference ($p<0.001$) between DM and MetS groups being higher in MetS group along with difference in other biochemical parameters. No is reduced in the course of vascular disease in DM. Increased production of superioxide anion on OS to reduce plasma NO levels.

Conflict of Interest-Nil

Source of Funding- Self

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Mini Review-Third Hand Smoke: A New Prospective

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ABSTRACT

Tobacco smoke (TS) causes over-expression of multiple genes involved in metabolism of carcinogens in oral epithelium. TS are of 2 types active and passive. According to a newer concept,third hand smoke (THS) is a form of residual tobacco smoke pollutants after the emission of tobacco smoke and remains on the surface for weeks and months together after cessation of smoking. We have earlier hypothesized that when oral mucosa of non-smoker person comes in continuous contact with THS, it could lead to oral cancer. Stem cells share similar attributes as of cancer stem cell. Evaluation of role of oral stem cells in carcinogenesis process is critical. Thus, for the first time, we would like to hypothesize that assessing oral stem cells could provide a good source to evaluate the role of THS in carcinogenesis and hence can act as a biomarker for the same.

Keywords- *carcinogens, oral stem cells, tobacco-smoke.*

INTRODUCTION

According to the International Association of Cancer Research (IACR), more than seventy different types of carcinogens from tobacco smoke (TS) are capable of causing various malignancies. The TS is present in two forms: active and passive smoke [1].

Active form or main stream (MS) smoke is a well-known entity and is responsible for causing multiple malignancies like cancer of pharynx, lung, kidney, cervix including oral cavity. Passivesmoke which is also known as environmental or second hand smoke (SHS) is defined as the smoke emitted from the burning end of a cigarette or from other combustible tobacco products, usually in combination with smoke exhaled by the smoker[1].In recent years, non-smokers are getting exposed to a newer risk of smoking called third hand smoke (THS), which is still relatively an unexplored entity. Thus, for the first time in literature, we have tried to explore the possible effectsof THS on oral stem cells and its role incarcinogenesis.

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DISCUSSION

As compared to MS, carcinogens from SHS are much higher in concentration. Studies have demonstrated that SHS is also associated with an increased risk of head and neck cancer [2].

It is an established fact that TS can causemutations like p53 mutation,allelic loss, and changes in methylation [3]. Similarkind of alterations has been demonstrated on the gene expression of buccal and nasal mucosal epithelial cells as a result of tobacco smoking. Overexpression of multiple genes encoding enzymeslike CYP1A1, CYP1B1, AKRs, ALDH3A1,NQO1, UGTsinvolved in the carcinogen metabolism have been found. Also the induction of 'xenobiotic metabolizing enzymes' by ligand activated aryl hydrocarbon receptor(AHR) found to contribute to the mutagenesis of the cells.Other than this enzyme, smoking also alters the enzymes related with oxidative stress,eicosanoid synthesis,nicotine signaling and cell adhesion [4].Moreover, it was found that TS contributes to the reduction in the number of early apoptotic cells and increase the number of late apoptotic cells [5].

In the oral cavity, the basal layer cells of oral epithelium show positivity for several stem cell markers like CD44, Bmi1, Sox2, Keratin 14, and aldehyde. Being the reservoir of the stem cell progeny, stem cells proliferate and differentiate as a step inregeneration[6]. This process is hampered by various factors like age, health, and lifestyleincluding direct continuous exposure of these cells with components emitted from the TS.A quantitative study demonstrated that the first significant response when oral epithelial cells get exposed to TS is overexpression of K14 which signifies the initial reaction from the basal and supra basal layer [7].

Penetrative ability of SHS is more effective than MS and thus more deleterious on stem cell niche. It was found that molecules in solid phase of SHS are of very small diameter (0.01 and 0.1 μm)as compared to MS smoke thus more "penetrative". Secondly, ph of SHS is more alkaline as compared to MS smoke[8]. Array of research work has illustrated that SHS adversely affect stem cell niche in various organs. Side stream smoke causes inhibition of growth of stem cells. Nicotine being responsible for the impairment of DNA synthesis and cell proliferation has showndirect and indirect effect on stem cell niche by causing alteration in their regulatory mechanism[9]. Also, it causes increased expression of Notch, Wnt or TGF-beta genes resulting in retention of stem cells in pluripotent phase [10].

In recent years, non-smokers are getting exposed to a new risk of smoking called third hand smoke (THS).THS is a form of residual tobacco smoke pollutants after the emission of tobacco smoke and remains on the surface for weeks and months together after cessation of smoking[11]. THS is a complex physiochemical reaction, which is responsible for the formation of carcinogenic compound known as tobacco specific nitrosamine (TSNA) [12].THS has been found to be more toxic than MS and SHS[11]. Oral mucosa is continuously getting exposed to THS by either adsorption,inhalation or ingestion because of constant contact of hands and fingers with the tobacco laden articles like bed,table,chair, eatables etc. It has been found that the person who is continuously exposed to THS exhibits an elevated level of carcinogenic agents in hisbody fluids [13].Thus, aim of our paper is to focus the light on the importance of the effects of "tobacco xenobiotic" exposure on oral stem cells in THS.

THS and oral stem cells

Oral stem cells and their microenvironment are potential targets for TS. The effect of THS on dermal (stratified squamous epithelium) stem cell niche can be seen in two different ways- firstly by diffusive transfer of chemicals from blood into growing organ and then deposited into the organ permanently. Other way of exposure is indirect exposure, from secretion of the glands directly or from externally via THS[14].It has been found that the various protective barriers of the body in tobacco smokers get significantly damagedleading to distribution of TS components in the body via blood when it is inhaled [9].Oral mucosa seems to be more prone to the adverse effects of tobacco as compared to the epidermis. It is extensively vascular, highly permeable and exhibits high turnover rate as compared to the skin [15].It is mostly non-keratinized unlike skin lacking the barrier function of orthokeratinised epithelium against the penetration of carcinogens from THS. Moreover, saliva acts as a constant medium to keep carcinogens in contact with the oral mucosal surface for a longer period of time. Also, saliva has a potential to metabolize carcinogens present in THS. In addition to this, microorganisms present in the oral cavity are also known to interact with various carcinogens.Thus by looking at all these aspects, it can be convincingly hypothesized that there could be more chances of exhibiting the same kind of effect or more by THS on stem cell niche of oral epithelium. There is definitely a kind of correlation between THS and oral mucosal stem cell niche.

It is also significantto evaluate whether these oral stem cells have an ability to retain the xenobiotics for longer period of time. Assessment of dose and time response of TS in THS on oral mucosal tissues (oral stem cell niche) could provide us a wider aspectof its adverse health effects. We would also like to suggest more studies on metabolism of THS by salivary enzymes and oral microflora.

CONCLUSION

In our previous article we have hypothesized that continuous contact of THS may have higher chances of developing head and neck cancer [16].One step ahead we would like to suggest that the research on estimation of THS would be beneficial in determining its effect in terms of occurrence of oral cancer. It would be benevolent to the non-smoker associated oral squamous cell carcinoma(OSCC). Thus, isolation of oral stem cells andby finding the effects of THSexposure will provide a good biomarker for evaluation of THS as an etiology for

oral cancer. Also, it can act as a biomarker to assess the malignant potential of various oral potentially malignant disorders. Thus, further studies are recommended to prove its significance.

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Lipid Profile Changes During Pregnancy in South Indian Population

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ABSTRACT

Pregnancy greatly increases demand for metabolic fuels that are needed for growth and development of the fetusand its support structures. Blood lipid concentrations, lipoproteins and apolipoproteinsin the Plasmaincreasesignificantlyduring pregnancy. The concentration of serum totalcholesterol, serum triglycerides, serum HDL and serumLDL in normal pregnant women increase withincreasing gestational age**.** The increase in maternal lipidprofile is in response to the maternal switch fromcarbohydrate to fat metabolism, which is an alternativepathway for energy generation due to high demand.Pregnancy is a stressful condition in which manyphysiological and metabolic functions.Lipid metabolism changes during pregnancy. Plasma lipid30 Pregnant women and 30 Non-pregnant women Blood samples were drawn from all the subjects following a fast of 12 hours and analyzed for Serum Triglycerides (TG), Total cholesterol (TC) and HDL cholesterol,LDL,VLDL,fasting Blood Sugar and Uric acid were analysed. This study results suggest that future lifestyle programs in women of reproductive age with a focus on lowering triglyceride levels (*i.e.* diet, weight reduction, and physical activity) may help to prevent hypertensive complications during pregnancy and adverse birth outcomes. Additional studies are needed to evaluate whether lowering TG levels by means of lifestyle programs (*e.g.* diet and physical activity) is beneficial in reducing adverse pregnancy outcome.

Keywords: *Pregnancy, Lipid profile,Diet,Pre-eclampsia,Insulin*

INTRODUCTION

The association of alteration of serum lipid profile in essential hypertension is well documented. An abnormal lipid profile is known to be strongly associated with atherosclerotic cardiovascular diseases and has a direct effect on endothelial dysfunction. Changes in carbohydrate and lipid metabolism occur during pregnancy to ensure a continuous supply of nutrients to the growing fetus despite intermittent maternal food intake. These metabolic changes are progressive and may be accentuated in women who develop gestational diabetes mellitus (GDM). Thus, although both uric acid and changes in lipid profile are associated with metabolic syndrome, these conditions could have opposing or perhaps synergistic effects on maternal and fetal health [1]. Altered lipid synthesis leading to decrease in prostaglandin I2: Thrombaxane I2 (PGI2 : TXA2 ratio) is also supposed to be an important way of pathogenesis in pregnancy induced hypertension [2]. Thus abnormal lipid metabolism seems important in the pathogenesis of pregnancy induced hypertension (PIH) too. The association of alteration in serum lipid profile in essential hypertension is well documented[2]. Hormonal imbalance leading to altered lipid profile in serum is assumed to be the prime factor in etiopathogenesis of pregnancy - induced hypertension (PIH).In this study,we explored uric acid concentrations and lipid profile in pregnant women during the third trimester of gestation.

MATERIAL AND METHOD

30 Pregnant women and 30 Non-pregnant women Blood samples were drawn from all the subjects following a fast of 12 hours and analyzed for Serum

Triglycerides (TG), Total cholesterol (TC) and HDL cholesterol (HDL-C) by enzymatic methods with the help of Glaxo kits on ERBA Chem- 5 semi auto analyzer. Serum LDL cholesterol (LDL-C) was calculated by Frederickson-Friedwald's formula according to which LDL cholesterol = Total cholesterol - (HDL cholesterol + VLDL cholesterol). VLDL cholesterol (VLDL-C) was calculated as 1/5 of Triglycerides and Fasting blood sugar and Uric acid were analysed. Data were statistically analyzed by Student's't' test and significance was expressed in term of 'P' value.

RESULTS AND DISCUSSION

Table. No.1: Serum lipid profile, Concentration of uric acid and fasting blood sugar in control and pregnancy volunteers

S.No.	Parameters (Mean ± S.D)	Non-pregnant women (No.30)	Pregnant women (No.30)	P value
1	Serum Triglyceride (TG)	134.2 ± 8.2	187.3 ± 12.1	<0.001
2	Total cholesterol	185.6 ± 13.2	206.5 ± 8.5	<0.001
3	HDL cholesterol	45.2 ± 7.4	56.8 ± 9.4	<0.001
4	Serum LDL cholesterol (LDL-C)	130.7 ± 12.5	105.1 ± 11.3	<0.001
5	VLDL cholesterol (VLDL-C)	22.1 ± 6.4	41.3 ± 7.2	<0.001
6	Serum Uric acid	3.5 ± 0.6	4.8 ± 0.8	<0.001
7	Fasting blood sugar	95 ± 6	112 ± 12.1	<0.001

Some previous studies showed that the most dramatic damage in the lipid profile in normal pregnancy is serum hypertriglyceridemia, which may be as high as two to three folds in the third trimester over the levels in nonpregnant women [3]. In our study also this observation holds true. Here the serum triglyceride concentration showed very significant,increase in the third trimester of normal pregnancy than in the nonpregnant women, the mean value being raised.

The first and second phases of insulin release are 3- to 3.5-fold greater in late pregnancy [4]. Obese pregnant women also develop peripheral and hepatic insulin resistance during the third trimester of pregnancy[5]. The hyperinsulinemic-euglycemic glucose clamp technique indicates that insulin-stimulated glucose disappearance, carbohydrate oxidation, and suppression of endogenous glucose production in obese women are reduced in the third compared with the second trimester. Although the precise mechanism is uncertain, alterations in the hormonal milieu during pregnancy are probably responsible for the reduced insulin sensitivity. Changes in β cell responsiveness occur in parallel with growth of the fetoplacental unit and its elaboration of hormones such as human chorionic somatomammotropin (HCS), progesterone, cortisol, and prolactin. Prevailing insulin resistance produces exaggerated changes in postprandial concentrations of metabolic fuels (eg, glucose, VLDL, and amino acids). Insulin resistance serves to shunt ingested nutrients to the fetus after feeding.n early pregnancy, basal glucose and insulin concentrations do not differ significantly from nongravid values [6]. Basal hepatic glucose production, estimated by using [6,6-$^2H_2$] glucose, do not differ at 12–14 wk of gestation. By the third trimester, however, basal glucose concentrations are 10–15 mg/dL (0.56–0.83 mmol/L) lower and insulin is almost twice the concentration of nongravid women. Postprandial glucose concentrations are significantly elevated and the glucose peak is prolonged [7]. Basal endogenous hepatic glucose production (R_a) increases by 16–30% to meet the increasing needs of the placenta and fetus[3,8, 9]. Glucose production increases with maternal body weight, such that glucose production per kilogram body weight does not change throughout pregnancy [9]. Endogenous glucose production remains sensitive to increased insulin concentration throughout gestation (90% suppression), in contrast with the progressive decrease in peripheral insulin sensitivity.Increased fasting blood glucose in pregnant women could indicate

danger signs which pose a threat to both the woman and the foetus since glucose is an important substrate for metabolism. A high increase in blood glucose during pregnancy could lead to gestationaldiabetes which is characterized by difficulty during delivery,abnormal foetal weight, adolescent obesity,and neonatal hypoglycaemia.In early pregnancy may be responsible for abnormal foetal development; and neurological defects have been seen in the offspring of diabetic mothers. More specifically, the frequent nocturnal hypoglycaemia some studies observed[9] among insulin-treated diabetic patients may, in severe cases, be a factor responsible for abnormal embryogenesis or perhaps for unexpected death of the foetus during the last trimester of pregnancy.

GDM is accompanied by alterations in fasting, postprandial, and integrated 24-h plasma concentrations of amino acids, glucose, and lipids. These changes include a 3-fold increase in plasma triacylglycerol concentrations during the third trimester of pregnancy, elevation of plasma fatty acids, delayed postprandial clearance of fatty acids, and elevation of the branched-chain amino acids[10].

The principle modulator of this hypertriglyceridemia is oestrogen as pregnancy is associated with hyperoestrogenaemia. Oestrogen induces hepatic biosynthesis of endogenous triglycerides, which is carried by VLDL [11]. This process may be modulated by hyperinsulinism found in pregnancy [12]. Serum triglyceride concentration also rose much more significantly in toxemia of pregnancy in our study which corroborated with the findings of many workers [13, 14]. The above mentioned interactions alongwith increased endothelial triglyceride accumulation may result in endothelial cell dysfunction in gestosis[15]. Cholesterol is used by the placenta for steroid synthesis and fatty acids are used for placental oxidation and membrane formation. Changes in total cholesterol concentration reflect changes in the various lipoprotein fractions. HDL cholesterol increases by 12 wk of gestation in response to estrogen and remains elevated throughout pregnancy [16]. Total and LDL-cholesterol concentrations decrease initially, but then increase in the second and third trimesters. VLDL and triacylglycerols decrease in the first 8 week of gestation and then continuously increase until term. In the second half of pregnancy, VLDL clearance is altered because of the decreased activity of lipoprotein lipase (LPL) in the adipose and liver and because of the increased activity in the placenta. In the fed state, hepatic LPL is low, but increases with fasting, which increases fatty acid and ketone production for the fetus while the supply of glucose is low.

We have also calculated the ratios between different lipids like LDL-C: HDL-C; TC: HDL-C; TG: HDL-C and HDL-C: VLDL-C. In present study there was a significant fall in LDLC: HDL-C in normal pregnant women as compared to nonpregnant women. LDL-C: HDL-C however increased significantly in eclamptic women as compared to normal pregnant women [17, 18].

The link between elevated uric acid concentration and metabolic syndrome in the absence of hypertension may be explained in part by elevated insulin levels reducing urinary excretion of uric acid. However, uric acid may also be an independent risk factor for the development of insulin resistance and subsequent diabetes, as elevated uric acid predates the development of type 2 diabetes in nonpregnant adults [19]. The combined effects of second-trimester insulin resistance and hyperuricemia without hypertension on fetal growth are striking [19]. Uric acid is a co-product of an equation that results in production of superoxide and can itself act as a free radical in a setting of low antioxidants[20]. We have also demonstrated that in an in vitro system, uric acid reduces the placental uptake of amino acids by the system A amino acid transporter [20].

Uric acid was associated with insulin resistance in midpregnancy, even among normal-weight women and those who remained normotensive throughout pregnancy[19, 21]. The relationship between uric acid and birthweight was mediated by the presence of insulin resistance. In the absence of insulin resistance, hyperuricemia was associated with an increased risk for reduced fetal growth among women who remained normotensive [19, 22].

Natural rising of plasma lipids is seen in normal pregnancy but this event is not atherogenic and it is believed this process is under hormonal control but in complicated pregnancy, there is a possible defect in the mechanism of adjusting physiologic hyperlipidaemia. There is a need to do routine tests for total cholesterol during pregnancy in order to differentiate between a physiological increase and a pathological one and to establish a national reference range for Indian Population.

The literature is also lacking of Large sample size

studies looking at repetitive insults to the cardiovascular system in multiparous women resulting from multiple changes in Lipid profile levels during pregnancy and if this relationship is affected by pregnancy spacing. Additional research is also needed in high risk pregnancies, such as those affected by diabetes and hypertension[23].And also additional research is needed to analyze the long term effects of fetal plaque build-up and the risk of subsequent cardiovascular health complications in both term and preterm infants. When studying this relationship one must also take into consideration the genetic aspect of hyperlipidemia compared to pregnancy induced hyperlipidemia as well as the environmental effects (i.e. diet and exercise) on cholesterol levels within the newborn and developing child.

CONCLUSION

Findings reported in this researchsuggest that the pregnant women studied had elevatedTG, TC, and LDL levels. Increased TG levels are usually. High blood pressure, if present at the same time, could lead to the development of pre-eclampsia. This association may be significant in understanding the pathological process of pre-eclampsia and may help in developing strategies for further research is needed to elucidate the mechanisms and consequences of alterations in lipid metabolism during pregnancy. This study results suggest that future lifestyle programs in women of reproductive age with a focus on lowering triglyceride levels (*i.e.* diet, weight reduction, and physical activity) may help to prevent hypertensive complications during pregnancy and adverse birth outcomes. Additional studies are needed to evaluate whether lowering TG levels by means of lifestyle programs (*e.g.* diet and physical activity) is beneficial in reducing adverse pregnancy outcome.

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Clinical Interpretation of Laboratory Tests in Hematology

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ABSTRACT

The Laboratory Services are very pleased to see this report. Lab test are integral to patient care and depend on cooperation and support of ward staff for accurate and timely interpretation of the results. Good lab results begin with proper collection of specimens and labeling. Nursing and ward staff can help by making sure proper directions are followed for specimen collection. Also of importance is the follow up of the results and appropriate action required based on the laboratory results. In this study explained many factors are considered in reaching a diagnosis and planning treatment. Common blood tests for patients complete blood counts. It is important for nurses as members of the interdisciplinary care team to be able to recognize abnormal lab values, and anticipate plans of care and treatment for their patients. Pathology test results influence about 70% of healthcare decisions

Keywords: *Laboratory tests; Complete Blood Count; Sensitivity; Hemoglobin*

INTRODUCTION

Blood constitutes 6 to 8 percent of total body weight. In terms of volume, women have 4.5 to 5.5 L of blood and men 5 to 6 L. In infants and children, blood volume is 50 to 75 mL/kg in girls and 52 to 83 mL/kg in boys. The principal functions of blood are the transport of oxygen, nutrients, and hormones to all tissues and the removal of metabolic wastes to the organs of excretion. Additional functions of blood are[1] regulation of temperature by transfer of heat to the skin for dissipation by radiation and convection,[2] regulation of the pH of body fluids through the buffer systems and facilitation of excretion of acids and bases, and[3] defense against infection by transportation of antibodies and other substances as needed. Blood consists of a fluid portion, called plasma, and a solid portion that includes red blood cells (erythrocytes), white blood cells (leukocytes), and platelets (thrombocytes). Plasma makes up 45 to 60 percent of blood volume and is composed of water (90 percent), amino acids, proteins, carbohydrates, lipids, vitamins, hormones, electrolytes, and cellular wastes[1].

Using laboratory values can be a key piece of assessment to determine what is occurring within the body of a patient. There are numerous laboratory tests that can be done. The most common tests include chemistry panels, hematology (such as the complete blood count), and blood gases[1]. Remember that there is some variation in ranges based on the laboratory, so be aware of the normal ranges for your facility. Some clinicians might tend to focus their attention on one or two abnormal laboratory abnormalities and forget to interpret the test results within the entire clinical context of the patient. The following information provides an overview of the interpretation of clinicopathological abnormalities as they apply to various clinical situations.

When performing serial laboratory tests on a patient, physicians are often faced with the problem of interpreting unanticipated abnormal results. Though a change in clinical status, laboratory error, or variations in test conditions or procedures may be responsible, a common cause is biologic variation within the individual. The clinician should search for the cause by first ordering

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various diagnostic tests such as a complete urinalysis, chest and abdominal radiographs, a complete serum chemistry evaluation, hematological and pathological investigations.

The treating practitioner is the most appropriate and qualified person to explain and discuss pathology test results. This is because tests represent just one of the many factors that are considered in reaching a diagnosis and planning treatment. Other factors may include age and gender, current condition and physical findings, medical, family and social history, medications, other diagnostic procedures, occupation, ethnicity, diet. Based on these background of many factors ie, what method, how many tests required, reproducibility, tests sensitivity specificity and provisional diagnosis are kept in mind and designed the study to written a Review on interpreting results in laboratory tests in particularly Complete Blood Count (CBC).

DISCUSSION

Collection of Blood Samples

The blood should always be drawn at about the same time of day and after at least eight hours of fasting, since both circadian rhythm and nutritional status can affect the findings. If strictly comparable values are required, there should also be half an hour of bed rest before the sample is drawn, but this is only practicable in a hospital setting. In other settings (i.e., outpatient clinics), bringing portable instruments to the relaxed, seated patient works well.

The CBC and differential count (diff) are a series of tests of the peripheral blood that provide a tremendous amount of information about the hematological system and many other organ systems. They are inexpensively, easily, and rapidly performed as a screening test. The CBC and diff helps the health professional evaluate symptoms (such as weakness, fatigue, or bruising) and diagnose conditions (such as anemia, infection and many other disorders). The CBC test examines cellular elements in the blood, including red blood cells, various white blood cells, and platelets. Some labs interpret test results a bit differently from others.

WBC (white blood cell) leukocyte count:

White blood cells help fight infections, so a high white blood cell count could be helpful for identifying infections and also indicate leukemia, which can cause an increase in the number of white blood cells.

RBC (red blood cell) erythrocyte count:

It helps us determine the total number of RBCs and gives us an idea of their lifespan, but it does not indicate where problems originate. So if there are irregularities, other tests will be required.

Hematocrit (Hct) :

Useful for diagnosing anemia, this test determines how much of the total blood volume in the body consists of red blood cells.

Hemoglobin (Hgb):

Importantly, hemoglobin delivers oxygen from the lungs to the entire body; then it returns to the lungs with carbon dioxide, which we exhale. Healthy hemoglobin levels vary by gender. Low levels of hemoglobin may indicate anemia.

Mean corpuscular volume (MCV):

It measures the average volume of red blood cells, or the average amount of space each red blood cell fills. Irregularities could indicate anemia and/or chronic fatigue syndrome.

Mean corpuscular hemoglobin (MCH):

It measures the average amount of hemoglobin in the typical red blood cell.Results that are too high could signal anemia, while those too low may indicate a nutritional deficiency.

Mean corpuscular hemoglobin concentration (MCHC):

This test reports the average concentration of hemoglobin in a specific amount of red blood cells. Here again, we are looking for indications of anemia if the count is low, or possible nutritional deficiencies if it's high.

Red cell distribution width (RDW or RCDW):

With this test, we get an idea of the shape and size of red blood cells. In this case, "width" refers to a measurement of distribution, not the size of the cells. Liver disease, anemia, nutritional deficiencies, and a number of health conditions could cause high or low RDW results.

Platelet count

Platelets are small portions of cells involved in blood clotting. Too many or too few platelets can affect clotting in different ways. The number of platelets may also indicate a health condition.

Mean Platelet Volume (MPV)

This test measures and calculates the average size of platelets. Higher MPVs mean the platelets are larger, which could put an individual at risk for a heart attack or stroke. When serial tests are performed on a patient, there are many possible reasons for unanticipated discrepant results[2-4]. Some are associated with preparations for and conditions of testing (pre analytic variation), some with the test procedures themselves (analytic variation), and some with total biologic variations in the individual patient. Simple factors such as position of the patient (sitting versus lying), movement, or exercise can also cause laboratory values of some analytes to differ significantly[2-3]. Studies comparing hematologic parameters in venous and capillary blood samples obtained from healthy adults have shown up to 32% decrease in platelet count, up to a 10% increase in hemoglobin level, and up to a 23% increase in total leukocyte count for the capillary specimens [5-6].

The leukocyte count appears to be slightly lower in the elderly than in the general population, a difference usually attributed to a slight decrease in the total lymphocyte count [7].

Leukocytosis :

An elevated total white blood cell count is usually interpreted as a sign of infection and clinician should interpret this finding merely as a sign of inflammation and/or necrosis. The differential white blood cell evaluation provides a more exact clue of the underlying cause. For instance, leukocytosis with numerous immature neutrophils and toxic vacuolization often signifies infection, but the presence of very immature cells with prominent nucleoli, abnormal nuclear-cytoplasmic ratios, and mitotic figures signifies hematopoietic neoplasia. Leukocytosis can occur from bacterial or mycotic infections, regenerative anemias, immune-mediated disease, neoplasia, and hemoconcentration. The erythrocyte sedimentation rate (ESR) increases with age, and the annual rate of increase has been quantified at 0.22 mm/hr. For the elderly, the reference range for the ESR includes values up to 40 mm/hr in men and 45 mm/hr in women[8]. Thus, the clinical finding of an elevated ESR in an elderly patient can be problematic, since it may or may notreflect the presence of underlying disease. By comparison, an ESR greater than 100 mm/hr is almost always associated with serious underlying systemic disease[9].

Generally, it is expected to contribute half or less than half as much to total test variation as does biologic variation[2-3]. In some circumstances, interindividual biologic variation may be explained and partitioned tute a according to recognized demographic factors, such as age, sex, race, pregnancy, or history of smoking[2-3]. When the percent of critical difference is multiplied by the upper limit of the reference range,the absolute value that would constitute a critical difference between serial determinations is obtained[10].

Adequate reference ranges for laboratory testing in the elderly are generally lacking, as is specific information on persons over age 75, who, ironically, constitute the fastest growing segment of the geriatric population[4,7,11]. There are many laboratory tests available to the clinician. Correctly used, these may provide useful information, but, if used inappropriately, they are at best useless and at worst misleading and dangerous. In general, laboratory investigations are used:

1. To help diagnosis or, when indicated, to screen for metabolic disease,

2. To monitor treatment or detect complications,

3. Occasionally for medico legal reasons or, with due permission from the patient, for research.

Over investigation of the patient may be harmful, causing unnecessary discomfort or inconvenience, delaying treatment or using resources that might be more usefully spent on other aspects of patient care. Laboratory investigations are very rarely needed more than once daily, except in some patients receiving intensive therapy. If they are, only those that are essential should be repeated. The main reason for asking for an investigation to be performed 'urgently' is that an early answer will alter the patient's clinical management. To do so, laboratory staff must have accurate information about the location of the patient and the person to notify[12]. It is always important that physicians not overreact to apparently abnormal

laboratory values by undertaking inappropriate further investigations or clinical treat ments. Laboratory values that may appear abnormal in 10% or more of the healthy elderly without necessarily representing a pathologic process include erythrocyte sedimentation rate, hemoglobin. To ensure proper assessment of the geriatric patient, the clinician needs to be aware of these age-related changes and possible effects on laboratory values.

Interpreting Results

When interpreting laboratory results, the clinician should ask the following questions:

Is the result the correct one for the patient?

Does the result fit with the clinical findings? Remember to treat the patient and not the 'laboratory numbers'.

If it is the first time the test has been performed on this patient, is the result normal when the appropriate reference range is taken into account?

If the result is abnormal, is the abnormality of diagnostic significance or is it a non-specific finding?

If it is one of a series of results, has there been a change and, if so, is this change clinically significant.

Abnormal results, particularly if unexpected and indicating the need for clinical intervention are best repeated ones and again had doubtful repeat twice.

METHODOLOGY

Interpretation may sometimes be even more difficult if the results obtained in different laboratories, using different analytical methods, are compared.

Reproducibility

Most laboratory estimations should give results that are reproducible to well within 5 per cent. Small changes in results produced by relatively imprecise methods are not likely to be clinically significant[12]. All negative subjects without the disorder in all subjects with negative test results. The predictive value of a positive result is the percentage of all positive results that are true positives: in other words, the proportion of screening tests that are correct[12]. But more individuals will be falsely defined as negative, that is, its sensitivity will decrease and its specificity will increase[12].

Clinicians has to decide and confirm then it is required when it comes to requesting and interpreting clinical biochemistry and haematology tests and give provisional diagnosis and whatever the laboratory people asking information and proper .The laboratory reference range should be consulted when interpreting biochemical results, and results should be interpreted in the light of the clinical findings. Keep it in mind Just because a result is 'abnormal' does not mean that the patient has an illness; conversely, a 'normal' result does not exclude a disease process[12].

We therefore recommend routine free Hb level determination in serum or plasma, or any other automated detection of the degree of hemolysis. Only for those analyses which are affected by the estimated degree of hemolysis, new samples have to be requested. Critical or panic values are laboratory results that are so far outside the normal range that they may require urgent action[13].

The only stable parameters seem to be RBCs and hemoglobin if the measurements are carried out following a delay especially for the evaluations we made with the normal specimens. For other parameters; delayed processing affects stability. It is possible to maintain the stability of specimens by refrigerated storage up to two days with some limitations[14]. Laboratory errors can no longer be seen as inevitable, but it can be actively streamlined and prevented. Laboratorians and clinicians should forge stronger links between diagnostic testing and patient outcomes [15].

Point of Care Testing occurs when pathology tests are performed on a testing device at the actual point of care, with results used immediately for patient care. It is particularly suited for critically ill patients in intensive care and emergency units, and in rural and remote communities where pathology laboratory access may be restricted by factors such as geographical distance. While patients cannot directly request a second opinion from the pathology laboratory, they can ask their treating practitioner to arrange one. This may involve collecting another sample, or a second pathology laboratory may be able to process the same sample.

CONCLUSION

Common blood tests for patients complete blood counts. It is important for nurses as members of the interdisciplinary care team to be able to recognize abnormal lab values, and anticipate plans of care and treatment for their patients. Pathology test results influence about 70% of healthcare decisions. Based on all the factors ie, age, gender, current condition, physical findings, medical, family and social history, medications, other diagnostic procedures, occupation, ethnicity, diet will kept in mind and write how many tests required to identify the diagnosis and treatment. So these Tests sensitivity, specificity and other factors explained in this review. Above all these factors how interpretating results in laboratory tests in particularly CBC.

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Nutritional Supplementation in Hepatitis

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ABSTRACT

The best way to get vitamins and minerals is through food. Food provides the greatest range of nutrients. However, a multivitamin/mineral supplement can be helpful, especially if you lose your appetite or can't eat a healthy diet. Folate is particularly important vitamin and is not obtained easily from food but is found in multivitamins. The above nutritional components have been successfully utilized in the care and rehabilitation of the diseased liver. Care must be taken and such a protocol must be reviewed by your physician or health care practitioner. Of utmost importance is rest and consistent utilization of the supplements and diet recommended. Adding appropriate nutritional supplements may have a positive effect on the health of your liver and on slowing the progression of hepatitis C.

Keywords: *Vitamins; Minerals; Hepatitis; Oxidative stress.*

INTRODUCTION

There are two sources of liver damage with chronic hepatitis C. One is from the infection itself. The other is from the immune system's attempt to fight the virus. Even if you eat a healthy, balanced diet that provides a broad spectrum of nutrients, there is may still be an important role for nutritional supplements. Antioxidants, amino acids, and fatty acids may help moderate liver damage in people living with hepatitis C. A process called oxidative stress plays a role in the progression of chronic hepatitis C. Oxidative stress occurs when free radicals (unstable electrons and oxygen molecules) move through the liver causing inflammation and scarring. Free radicals form naturally in the body, especially when the immune system attacks an invader. The process is accelerated in chronic viral infections. The amount of damage caused by oxidative stress is linked to both the grade of liver fibrosis and the overall level of liver damage[1-2].The level of glutathione (an antioxidant) can be significantly depressed in many people with hepatitis C.1 Insufficient amounts of glutathione can reduce the liver's ability to break down drugs, chemicals, and other toxins. This can result in liver damage.

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Antioxidant Supplements:

A study of people chronically infected with the hepatitis C virus (HCV) found their blood levels of the antioxidants glutathione, vitamin A, vitamin C, vitamin E, and selenium were much lower than those of people the same age and sex who did not have HCV[3]. Low levels of antioxidants were accompanied by high levels of blood markers that indicate oxidative stress (damage from free radicals). The levels of these markers were closely correlated to the amount of liver fibrosis. The higher the level of oxidative stress, the more advanced the fibrosis. Fibrosis was also related to low blood levels of the same antioxidants. These findings applied not only to people with significant fibrosis and cirrhosis on liver biopsy, but also to those with minimal fibrosis and no cirrhosis. Higher levels of oxidative stress were associated with lower levels of antioxidants and more severe liver damage. The most important information this research reveals is that even in the beginning stages of hepatitis C, antioxidants are important. Although this information does not prove antioxidants prevent liver damage, the authors of this research suggested that antioxidants might play an important role in slowing the

progression of HCV and delaying the onset of cirrhosis. Nutritional antioxidants can counteract the damage caused by oxidative stress and low glutathione levels. Many different antioxidants work in many different ways in the body. These include vitamins A, E, and C, the family of carotenoids (including beta-carotene), the minerals zinc and selenium, alfa-lipoic acid, N-acetyl cysteine, and SAMe. The process of inflammation involves the accumulation of fat in the liver. Fatty cells are susceptible to damage, which can cause fibrosis and, ultimately, cirrhosis[4-5]. Vitamin E, selenium, zinc, and N-acetyl cysteine (NAC) have also been studied for their potential to inhibit fibrosis in chronic hepatitis. Of particular importance are the antioxidants and nutrients that work together to increase glutathione. The use of supplements to normalize glutathione levels may be very important for preventing liver damage. The nutrients that contribute to glutathione production are alfa-lipoic acid, vitamin C, vitamin E, NAC, and glutamine. The B vitamins and the mineral selenium also contribute to the antioxidant defense system. Following are descriptions of several nutritional supplements, their effects in the body, and their roles in maintaining or improving liver health. Alfa-Lipoic Acid Alfa-lipoic acid (ALA) is a fatty acid and an antioxidant. ALA is rapidly depleted when the liver is under stress. ALA has a long history of use in Europe where it is used to treat liver disorders because of its apparent ability to help the liver repair itself[6]. ALA's effectiveness in raising cellular glutathione levels is thought to be very important for liver repair with diseases like hepatitis C and HIV since both can cause glutathione deficiency. Unlike most other antioxidant nutrients that work in either the fatty parts of the body (including the outer layers of cells) or the watery parts (including the blood), ALA works in both. This allows ALA to provide protection to cells throughout the body. ALA also helps recycle and regenerate other antioxidants including vitamins E and C. This helps maintain optimal levels of these nutrients in the body. ALA has been given in doses up to 1,200 mg intravenously without toxicity. The only side effect reported was nausea and vomiting, and this was reported infrequently. No side effects have been reported with oral doses up to 1,000 mg daily[7-8]. Oral ALA doses of 500 mg to 1,000 mg have been well tolerated in placebo-controlled studies[9].

Selenium:

Selenium is a mineral that has been investigated for its potential to improve immune function and decrease cancer risk. Selenium provides powerful antioxidant protection to the body via the selenium-containing enzyme glutathione peroxidase. This enzyme helps the body maintain sufficient levels of glutathione in the liver and all other glutathionecontaining cells of the body. Selenium is one of the most crucial of all nutrients for maintaining effective immune responses. Many cancer researchers believe it is one of the most important nutrients in preventing cancer. Selenium is one of the antioxidant nutrients that can be significantly reduced among people with HCV[3] One study found people with hepatitis C who did not have cirrhosis had selenium levels 20% below normal, and those with cirrhosis had levels 40% below normal. Selenium is very important both as an antioxidant and as a cancer prevention agent. Therefore, low selenium levels in people with hepatitis C could contribute to progressive liver damage and the development of liver cancer. One study looked at selenium levels in 7,342 men with chronic hepatitis B and C and their risk of developing liver cancer (hepatocellular carcinoma)[3]. For analysis, the participants were divided into four groups based on their selenium levels. The study found selenium levels were lowest in the men with chronic hepatitis C. Participants in the group with the highest selenium levels were 38% less likely to get liver cancer than those in the group with the lowest selenium levels. This decreased risk of liver cancer was greatest in the men with chronic hepatitis C who smoked and had low levels of vitamin A or carotenoids. Carotenoids are vitamin A-like compounds including beta-carotene.

Another selenium studied in chronic hepatitis B and liver cancer, involved 130,471 people[8]. Participants were given table salt that had been supplemented with selenium and were followed for eight years[10]. The rate of liver cancer in people taking supplemental selenium was found to be one third lower than the usual liver cancer rate observed in that area. This indicates the supplemental selenium may have had a preventive effect on the development of liver cancer in this group of chronic hepatitis B patients. A study that examined selenium levels in HIV-positive people showed people coinfected with HCV and HIV had lower levels of selenium than those who had only HIV[11]. HIV infection is more likely to be fatal in a person who is selenium deficient[12]. Selenomethionine appears to be one of the safest and most absorbable forms of selenium. Other forms of selenium can be toxic at high doses. Selenium provides general antioxidant protection and immune defense.

Vitamin C:

Vitamin C (ascorbic acid) is a powerful antioxidant and natural anti-inflammatory agent. Both characteristics are crucial for people with hepatitis C since much of the damage caused by HCV comes from a combination of oxidative stress and inflammation in the liver. One recent study examined the relationship of blood levels of vitamin C to ALT levels in people living with hepatitis C. The researchers found that higher ALT levels were associated with lower levels of circulating vitamin C. They concluded this relationship may indicate greater consumption of vitamin C with increasingly severe oxidative stress in the liver. Vitamin C is also very important for immune function. The white blood cells that perform many of your immune functions are dependent on vitamin C. Therefore, vitamin C is a crucial nutrient for control of any viral infection. Individual needs for vitamin C vary. For this reason, recommended dosages can range from 1,000 mg to 6,000 mg or more per day. Amounts in excess of individual tolerance of vitamin C can result in gas and/or diarrhea.

Vitamin E:

Vitamin E is an antioxidant that works in the fatty parts of the body, including the outer layers of cells called cell membranes. Vitamin E is important for the protection of liver cell membranes. In one study, people with hepatitis C undergoing interferon based therapy were divided into three treatment groups. Group 1 took interferon alone. Group 2 took interferon plus 1,800 mg of NAC and 400 mcg of selenium per day. Group 3 took 544 IU of vitamin E per day in addition to interferon, NAC, and selenium. Liver enzyme levels, HCV viral load, and response to interferon were similar in the first two groups. Those who received the complete combination that included vitamin E had a significantly greater response to treatment and achieved significantly greater drops in viral load. Although the study was small and the relapse rate was equal in all groups, the effect of the combination that included vitamin E was significant. It is unclear whether the vitamin E alone should be credited with the improved results or, perhaps more likely, the improvement was the result of using an effective combination of nutrients. It is always important to remember that nutrients interact in many ways and places in the body. Thus, combinations often work better than an individual nutrient. Another study of hepatitis C patients on 800 IU of vitamin E found almost half the participants experienced improvement of liver enzyme levels. Liver enzymes went back up almost immediately after stopping the vitamin E. This suggests that vitamin E was neither combating the viral infection nor permanently stopping the process of inflammation in the liver, but was directly affecting inflammation in the liver while it was being taken. In other words, vitamin E only works while you take it. Animal studies have shown d-alfatocopherol inhibits the genetic mechanisms that lead to cirrhosis. Vitamin E and vitamin C supplementation was recently examined in a study of people with NASH but without HCV. NASH stands for non-alcoholic steatohepatitis. A larger clinical trial is needed to determine this with certainty. A dose of 800 IU to 1,200 IU of vitamin E daily is safe, unless you are on a blood-thinning drug such as coumadin or suffer from a vitamin K deficiency. Talk with your doctor to be sure the dose you are taking is safe in combination with your other medications.

Zinc:

Patients with chronic liver disease can have low levels of several minerals including zinc. Zinc deficiency is known to suppress the immune system. A small study of 40 people undergoing interferon plus ribavirin therapy for HCV found zinc levels among those with hepatitis C were significantly lower in those with HCV compared to healthy control subjects. These levels were further depressed during interferon-based therapy, but were restored to normal by supplemental zinc. No difference in viral response to the interferon-based therapy was found between those receiving zinc supplementation and those who did not receive supplemental zinc. Researchers have begun to examine whether supplemental zinc may enhance response to interferon-based therapy for HCV[6]. In another small study (23 participants), the addition of zinc to pegylated interferon plus ribavirin treatment was found to provide no advantage in terms of viral response[7]. Both zinc and carnosine are available as supplements. It is not known whether taking zinc and carnosine as separate supplements has the same effects as polaprezinc itself.

Nutritional Considerations - Diet

The goal of treatment is to relieve symptoms and to promote healing of liver tissue and function. The importance of the diet and nutritional supplements cannot be overemphasized in efforts to prevent relapse and aid in

the recovery process. Immediately, all offending dietary agents must be removed including: alcohol, caffeine, drugs, aspirin/Tylenol, sugar, margarine, fried foods and high doses of niacin or vitamin A. Dietary manipulation must include the following[13-18]:

Initial Stages

Foods of liquid to soft consistency may be preferable if there is anorexia present. This affords the practitioner an excellent opportunity to utilize several quality protein/calorie powder supplements, particularly the high quality whey proteins, and additional balanced amino acid supplements.

Adequate Protein Intake

Essential for healing and repair, adequate protein intake is a critical component of the diet. Ideally, 60 - 120 grams of good quality protein is recommended daily and should be adjusted to body weight (at least 1 - 1.5 grams protein per kilogram of body weight). Although the protein intake may be obtained from both animal and vegetable sources, adequate quality protein may be easily obtained via animal sources and may be the choice when appetite is limited in the initial stages of the disease.

Calories

Sufficient calories are to be provided to maintain weight or address weight loss (at least 30 calories per kilogram of body weight). A liberal intake of complex carbohydrates and low fat yet adequate essential fatty acids is essential. If a low fat intake is prescribed, the use of essential fatty acid supplements are advisable and may include borage oil, evening primrose oil, flaxseed oil and the marine lipid concentrates. Small frequent meals to provide calories and are recommended over the high calorie powdered supplements on the market that chiefly consist of high refined sugars. Additionally, the use of a powdered high chlorophyll beverage such as the cereal grasses are an excellent addition of calories as well as being nutrient dense with cleansing & detoxifying properties.

SUMMARY AND CONCLUSION

There is strong evidence that nutritional supplements such as antioxidants can play an important role in limiting the chronic inflammatory effects of HCV in the liver. Antioxidant supplements may counteract the damage caused by increased free radical activity in the body. Other nutrients such as glutamine are important in the production of glutathione, an antioxidant used by the liver to break down toxins, drugs, and chemicals. Adding appropriate nutritional supplements may have a positive effect on the health of your liver and on slowing the progression of hepatitis C.

Conflict of Interest: Nil

Source of Funding- Self

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The Effect of Peer Tutoring and Social Skill on Learning Results and Concepts Application for Students of Health Department

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ABSTRACT

This study aimed to determine the effect of peer group learning and social skills learning strategy on the learning outcomes of understanding and application of concepts on the basic concept of nursing. The study used pseudo experimental design. The subjects of the study were nursing students of Malang with 76 students. Data collection was a test on social skills and learning outcomes. Data was analyzed by using Anova. The results indicated that: (1) learning achievement in applying peer tutoring strategy gave better effect than direct learning strategy (2) students with high social skills had higher average score than low social skills.

Keywords: *Learning strategy, Peer tutoring, Social skills.*

INTRODUCTION

Study of Nursing Basic Concept (NBC) is an important subject in nursing higher education because it is the basic in applying nursing care to patients. But the reality at this time is still obtained the low level of understanding and application of concepts as a result of learning. In addition NBC is a course that aims to build collaborative skills both with fellow nurses and other disciplines, so it takes the ability of social skills. The result of student learning outcomes in the subject of the concept of nursing that is less satisfactory caused by several factors, that is in the process of learning the role of lecturers is still very dominant and tend to be the main determinant factor, another factor is most lecturers use relatively equal learning strategies and rarely use approaches involving student activities. Lacking opportunities for students to interact with another students causes them to lose their time to articulate their learning experience. Lessons that provide critical thinking and social interaction exercise only get a small portion of time so that students tend to behave individually and compete to get high academic score.

Thus the lecturer should anticipate that the dominant competitiveness atmosphere will not be created in the learning, but to condition the tolerant classroom, to give the students an opportunity to help each other, and to facilitate the students to be academically successful together. In other words, cooperative learning is required. If a lesson focuses on the cooperative aspect, then the concept of uniformity should be abandoned and begin to appreciate the diversity of students.

One of the learning methods that can encourage students to actively participate is the peer tutoring learning strategy. Selection of peer tutoring learning strategy as a learning strategy will help students in teaching material to their friends. *"Peer tutoring is a term of used for in dividuals who under direction of a teacher, provide instructional assistance to other individuals of the same age"*.[1]

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The importance of choosing a peer tutoring learning strategy is that students with high learning speeds can act as peer tutors, providing assistance to students with low learning speeds.[2] Peer group heterogeneous peer learning allows it to be implemented in small groups to solve the problems faced by them.[3] Personal teaching by friends among students of the same age can be more easily planned and also has been found to be very effective, Fantuzo and friends.[4] Peer tutoring method is done by empowering the ability of students who have high absorption, the students are teaching the material to his friends who have not understood so as to fulfill the learning mastery. It is expected that with the peer tutoring, less active learners become active because they are not shy to ask and express opinions freely to peers.

Social skills affect individual social adjustment. Individuals who have high social skills tend to get better social acceptance, while individuals with low social skills tend to have poor social acceptance. Individuals who lack social skills tend to influence the development of personality. Individuals who are well received in their social groups show pleasant, happy and secure characteristics.[5]

Social skills involve behaviors that permit social relationships and enable one to work effectively with others. Skills at each disparate, depending on environment, family and education. Ideally, psychologically, children's development basically has good social skills. Many of the students did not have good social skills, thus experiencing difficulty in cooperative learning.[2] There is a close relationship between the ability to interact socially and learning outcomes, means the better the ability to interact socially the better the learning.[6]

In achieving the learning outcomes of understanding and application of concepts in the Study of NBC, peer tutoring is an appropriate innovation in facilitating learning, supported by social skills. So the learning objectives of understanding and application of concepts and ability collaboration is obtained.

MATERIAL AND METHOD

The design of this research was quasi experiment with pretest-posttest non equivalent control group design, with 2x2 factorial version, with three variables, namely: peer tutoring learning model (independent), social skill (moderator), and learning comprehension result and concept application (dependent).

The subjects of the study were the 76 first semester students at Department of Nursing, Health Polytechnic of Ministry of Health at Malang. Data was collected by using (1) comprehension test and application of concept of nursing consisting of pretest and posttest, (2) questionnaire to measure social skill. Data was analyzed by using two ways Anova.

FINDINGS

The table 1 and 2 above show that in class with peer tutoring, the mean score of understanding the concept with low social skills was 86.42 and 84.69 for concept application. While in learners who have high social skills, mean score of understanding the concept was 89.55 and 85.82 for concept application. In the control group, mean score of understanding the concept of learners with low social skills was 72.41 and 72.0 for concept applications. While in learners who have high social skills, mean score of understanding the concept was 75.11 and 74.71 for the concept application.

Table 1. Results of Pre-test

Social Skills	Control Group (without Peer Tutoring)				Experiment Group (with Peer Tutoring)			
	Understanding of Concept		Application of Concept		Understanding of Concept		Application of Concept	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Low	55.41	10.90	57.26	6.06	59.19	7.58	55.69	4.65
High	59.71	5.34	60.50	4.82	62.59	5.28	61.20	5.83

Table 2. Result of Post-Test

Social Skills	Control Group (without Peer Tutoring)				Experiment Group (with Peer Tutoring)			
	Understanding of Concept		Application of Concept		Understanding of Concept		Application of Concept	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Low	72.41	3.40	72.00	6.80	86.42	5.28	84.69	3.26
High	75.11	2.93	74.71	7.44	89.55	5.51	85.82	3.25

All of hypothesis testing (Pillai, Wilk's Lambda, Hotelling and Roy's) showed p-value of 0.000, so it could be concluded that the post test value of conceptual understanding and application of nursing concept concepts together shows a real difference in both learning strategies. In testing social skills, all procedures show p-value of 0.005, so it could be concluded that the post test value of conceptual understanding and application of the basic concepts of nursing together show significant differences in the two skills of social skills.

Then on the line of interaction between learning strategies and social skills have significance values tested by Pillai, Wilk's Lambda, Hotelling and Roy's procedures. All procedures showed p-value of 0.759, so it could be concluded that the post test score of understanding of concept and application of basic concepts in nursing learners together shows no significant difference in the interaction between learning strategy (peer tutoring and without peer tutoring) with social skills (high social skills and low social skills).

DISCUSSION

Peer Tutoring learning strategy produced better learning result when compared with learning without peer tutoring. Learning is a process of constructing an understanding of the world in which we live, students constructing knowledge in their own minds.[7] The construction of knowledge implies that knowledge is not passively accepted, but actively. Building students' knowledge of the concepts of nursing is obtained through reflection on the physical environment and mental activity of students.

Peer tutoring learning model is a teaching and learning activities conducted by students in groups with each other without direct intervention from teachers. Peer tutoring is a method of teaching and learning with the help of a competent learner to teach other students, students are required to actively discuss with each other doing group work with guidance or guidance of a competent friend. Tutorial activities encourage cooperation among students in learning activities encourage the achievement of learning objectives with the help of peers who are clever have basic ideas how to motivate students in groups so that they can encourage and help each other, in mastering the material presented and foster an awareness that learning is important, meaningful and fun. In peer tutoring method students are equally paired with high and low ability, in a group of 4-5 people and each group is guided by one tutor. Some results have been done to know the advantages of learning by peer tutoring methods of research, among others.[8]

Student learning achievement who follow cooperative learning with the same age of tutor is better than learning achievement that follows conventional learning. Cooperative learning of peer tutors has better results than conventional learning in economics lessons.[9] Supporting factors in the implementation of peer tutor model of the interaction between teachers and students, student learning interest is quite high, teachers and students are more familiar in learning activities, peer tutor involvement in study groups make the atmosphere more interesting in learning.[10] Peer tutors in the learning process can improve student activities and learning outcomes.[11] Student learning outcomes that are taught with peer tutor learning are higher than expository learning.[12]

The cooperative learning model is a practical classroom technique that can be used daily to help students learn from basic knowledge to complex

problem solving. This model refers to teaching methods where students work together in small groups help each other to achieve shared goals in learning, so that students become more active, one important aspect in cooperative learning is to help develop cooperative behavior and better relationships among students, so that assisting in his academic learning, this kind of learning model offers students the freedom in the learning process. Through this method students are expected to engage in a research process that requires students to identify problems, collect data and use the data for problem solving.

To develop students toward professional nurses, the development of a model or learning strategy with cooperative learning approach is an appropriate choice because with this approach the students will learn actively to the problems either individually or in groups and find solutions or alternative problem solving either independently or collaboratively.

Related to the paradigm of learning peer tutoring this learning is one of the alternative learning in accordance with current conditions oriented to constructivism. Constructivist philosophy is the foundation for many learning strategies, especially those known as student-centered learning, student-oriented learning. Things that need to be understood based on the basic premise of constructivism that prioritizes students' activity in constructing their knowledge based on their interaction with the learning experience gained, it is clear that in this case the students and the student learning process become the main focus while the lecturer acts as the facilitator, and or together the students are also involved in the learning process, knowledge construction process.

Related to the paradigm of learning peer tutoring this learning is one of the alternative learning in accordance with current conditions oriented to constructivism. Constructivist philosophy is the foundation for many learning strategies, especially those known as student-centered learning, student-oriented learning. Things that need to be understood based on the premise of constructivism that prioritizes students' activity in constructing their knowledge based on their interaction with the learning experience gained, it is clear that in this case the students and the student learning process becomes the main focus while the lecturer acts as the facilitator, and the learning process.

Research findings of learning outcomes understanding and application of concepts in the Study of NBC is easier to master students who have high social skills. This is possible because the characteristics of students who have high social skills in accordance with the nature and characteristics of learning materials the basic concept of nursing which aims to provide a basic in nursing care based on communication skills and collaboration in solving problems. Thus there is learning basic concept of nursing provides an opportunity for students to make their skill better and their capability in using or applying theories on nursing care as well as adapt to professional behavior.

Students who have high social skills are acceptable and popular among peers, have situational behavior and can maximize relationships. Furthermore, social skills are behaviors in certain situations, the ability to predict the results of social interaction for students in the form of peer acceptance, popularity, teacher appraisal, academic achievement and social behavior correlate consistently.[13] There is a close relationship between the ability to interact socially with learning outcomes means increasingly both the ability to interact socially the better the learning outcomes.[6]

CONCLUSION

Based on the results could be concluded that Peer Tutoring learning strategy produced better learning result when compared with learning without peer tutoring. Social skills of students have a significant effect on the achievement of learning outcomes, it is suggested to the lecturer of the basic concepts of nursing in the Department of Nursing to consider students' social skills in learning.

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Comparative Evaluation of Compressive Strength of Ketac Molar, Fuji IX and Equia Forte

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ABSTRACT

Glass Ionomers have been shown to be a very useful adjunct to restorative dentistry due to their properties such as ; biocompatibility with body's hard tissue, long-term fluoride release, low thermal expansion coefficient, good adhesion to moist enamel and dentin without requiring an intermediate agent and low cytotoxicity. Compressive stress results when the body is subjected to two sets of forces in the same straight line but directed toward each other and it is an important property to be considered while choosing a restorative material. FUJI IX and Ketac Molar are two conventional packable high strength glass ionomer cements used to restore teeth in high stress bearing areas. Equia Forte which is a relatively new glass ionomer cement which can be used to restore teeth in high stress bearing areas .It containins ultrafine glass particles and a higher molecular weight Polyacrylic acid. the purpose of the study undertaken was to evaluate and compare the compressive strength of FUJI IX , Ketac Molar and EQUIA FORTE.

Keywords: *compressive strength, Equia Forte , Fuji IX , conventional packable high strength glass iononer cement.*

INTRODUCTION

Dental caries dates back to ancient times and is the one of the most common disease affecting human race. Once a carious lesion occurs it becomes necessary to restore the cavity.One of the most commonly used material for restoring the teeth is glass ionomer cement. Since glass ionomer cements were introduced in the 1970's by Wilson and Kent, they have constantly undergone many improvements[1]

Glass Ionomers have been shown to be a very useful adjunct to restorative dentistry because of their properties such as ;proper biocompatibility, long-term fluoride release, low thermal expansion coefficient, good adhesion to moist enamel and dentin without necessitating an intermediate agent and low cytotoxicity.[2,3]

Compressive stress results when the body is subjected to two sets of forces in the same straight line but directed toward each other.

There is little literature available on the compressive strength of Equia Forte which is new glass ionomer cement containing ultrafine glass particles and a higher molecular weight Polyacrylic acid.

Considering the importance of compressive strength of restorative materials, the purpose of the study undertaken was to evaluate and compare the compressive strength of two conventional packable high strength glass ionomer cements(FUJI IX , Ketac Molar) and a glass ionomer cement with ultrafine highly reactive glass particles and high weight poly acrylic acid(EQUIA FORTE).

MATERIALS AND METHOD

The three Groups of glass-ionomer cements tested in this study are:

Group 1: Calcium based conventional high viscosity glass ionomer cement(KETAC

MOLAR, 3M)

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Group 2:Strontium based Conventional high viscosity glass ionomer cement(FUJI IX,GC)

Group 3: Glass ionomer cement with ultrafine highly reactive glass particles and high weight poly acrylic acid(EQUIA FORTE,GC)

The materials were mixed according to the manufacturers instructions.Specimen dimensions of 6mm x 4mm were achieved using a metal split mould. The insertion of material into the mould was done slowly to adapt the material and avoid bubble formation.

The moulds were slightly overfilled with the glass ionomer cement; transparent matrix strip covered with a thin layer of petroleum jelly was placed on the material. Hand pressure was then applied for excess material to be extruded from the top of the mould.

The Specimens were then Stored in glass bottles for 24 hours.Tests were conducted in an Universal Testing Machine at Yenepoya Dental College at a crosshead speed of 1.0mm/min. Statistical analysis was done using the anova and tukey tests

FINDINGS

The results were as follows:

GIC GROUP	Compressive Strength(MPa)
GROUP 1(Ketac Molar)	182.2
GROUP 2(Fuji IX)	137.7
GROUP 3(Equia Forte)	137.15

Compressive strength of Group 1 was 182 MPa which is significantly more than the group 2 (Fuji IX) which is 137.7 MPa and Group 3(Equia Forte) which is 137.15 .

DISCUSSSION

Compressive strength of Group 1 was 182 MPa which is in accordance to a study done by Xu X et all .Group 1(Ketac molar) had significantly more compressive strength than the group 2 (Fuji IX)which is in accordance to a study done by Xu X et all.[4] Group 1(Ketac Molar) also had significantly more compressive strength than the group 3(Equia Forte group).There was no significant difference between group 2(Fuji IX) and group 3(Equia Forte group).

According to Xie D et al the high powder to liquid ratio in Ketac Molar gives it high compressive strength .The authors also state that the more dense surface textures, less and smaller voids, and smaller particles in the Ketac molar may result in a higher compressive strength.High amounts of glass filler particles in the Ketac Molar may have resulted in high compressive strength values.[5]

Generally Resin modified cements have a higher compressive strength than conventional GIC's. But according to a study done by Xu X et all Ketac-Molar, had a higher compressive strength than some of the resin-modified glass ionomers being compared.They attributed this probably to the higher filler load of the material.[4]

Studies suggest the use of smaller specimen dimensions such as "6 mm x 4 mm" to investigate mechanical properties of glass ionomer cements, according to ISO 7489:1986 specifications.The objective is to reduce the variability that may result when large amounts of material are manipulated . [6]

The strength values of glass ionomer cements shown in literature are difficult to be compared due to the great variability in test conditions and available material. These differences can be caused due to composition, manufacturing process, size of the powder particles, type, concentration and molecular weight of liquid, and powder-liquid ratio .[7]

CONCLUSION

The values from strontium based conventional high viscosity glass ionomer cement(FUJI IX) and Glass ionomer cement with ultrafine highly reactive glass particles and high weight poly acrylic acid(EQUIA FORTE) showed no statistical difference.

The calcium based conventional high viscosity glass ionomer cement(KETAC MOLAR)had signifacntly higher values than the other two groups(FUJI IX and EQUIA FORTE).

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Prospect of Medical Tourism in the State of Odisha: An Analytical Report from the Selected Private Tertiary Care Hospitals

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ABSTRACT

Background: Globalization and technological advancements has enabled health care sector worldwide to provide its services at an affordable cost thereby promoting medical tourism. Developing countries including India are also in the race to attract the people from other parts of the world to avail the health care services in the native land.

Objectives: This study is an attempt has to assess the ground realities of existing health care services in tertiary care hospitals in Odisha, to find out deficits and suggest corrective measures to facilitate medical tourism in the state.

Method: Random sampling was done from three private tertiary care teaching hospitals. Opinions of the patients were captured in the form of questionnaire and assessed using SERVQUAL scale to find the gap between their expectations and perceptions. Likert scale was used to record the responses regarding the reason of their choice of hospitals, pricing of health services and attitudinal loyalty.

Result: The quality of the services was the major deciding factor while cost was the least in choosing any particular hospital. The gap between expectation and perception was highest for empathy of health care providers. Around half of the respondents were satisfied with the health care services provided. Most respondents had positive attitudinal loyalty towards the hospitals.

Conclusion: Ample scope of medical tourism exists in Odisha, provided continuous assessment of service qualities and necessary corrective measures are taken to reduce the gap between customer expectations and perceptions.

Keywords: *Medical Tourism, Hospitals, Service Quality, SERVQUAL scale, Likert Scale*

INTRODUCTION

Medical Tourism is about visiting a foreign land for availing health care services.[1,2] After the globalization has started, the physical, financial, technical & psychological barriers of people has been reduced substantially. Health care sector in many developing countries has improved a lot providing quality medical services and India is no exception to it. At present, patients from the developed world, are not hesitating to visit the developing countries for availing health care due to factors like costs, waiting time, privacy, confidentialities, availability of specific medical services.[2] Fueled by the boom in the corporate sector, whole-hearted support from the government, use of cutting edge technology and skill has propelled India significantly in the world medical tourism map

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and currently a favoured destination for the medical tourists.[3,4] Additionally, use of alternative medicine, wellness, rejuvenation programs associated with ancient religious, cultural and natural attractions have given India an extra mileage in the race .

India is ranked amongst the top world destinations in terms of offering cross border health care.[5] The global medical tourism industry was estimated at USD10.5 billion in 2012 and expected to grow at a CAGR of 17.9 per cent to reach USD32.5 billion in 2019.[6] India issued around 1.78 lakh medical visas in 2016 that includes follow up treatment, as against the 1.22 lakh in 2015. The country is witnessing 22-25 percent growth each year and it is predicted to reach $6 billion by the end of 2018.[7]

On the other hand several distressing & disheartening news published in different media from time to time points towards a very dismal state of the current health care system in India. While we are in the process of establishing India as a world-class health destination to attract medical tourist from across the countries, it is lagging far behind the developed nations in terms of provision of accessible, affordable quality health services for a large part of its population.

With this background, we have tried to assess the service quality in few tertiary care teaching hospitals in order to understand and prepare a ground report of the services offered and tried to suggest some measures for improvement of facilities to make them able to compete in medical tourism at global scale.

MATERIALS AND METHOD

The study was conducted in three private teaching hospitals in Bhubaneswar, a prominent capital city in the eastern part of India namely IMS & SUM Hospital, Kalinga Institute of Medical Sciences (KIMS) and Hi-tech Medical College providing tertiary health care services. The study was approved by the institutional ethics committees of the respective hospitals and informed consent of patients were obtained prior to their participation.

Objectives of the study are to

- Assess the reasons for which patients normally prefer to avail the services in the selected hospitals and the gap between their expectation and perception levels
- Estimate average spending towards the various services of the hospital and map their levels of satisfaction and feelings towards the hospitals.
- Build up suggestions for improving service qualities of the hospitals.

SERVQUAL scale developed by Parsuraman, Zeithamal and Berry was used for measuring the gap between the perception and expectation levels of patients.[8,9] The scale containing a set of 22 parameters and covering 5 dimensions of customer perception along with some open ended questions in the form of a questionnaire was served to the patient to respond. A copy of sample questionnaire has been uploaded to Micosoft™ Onedrive™ cloud and can be viewed/downloaded from: https://goo.gl/xgYHZt . The 5 dimensions were:

- Tangibles – Includes the physical facilities, entities, equipments, personnel, their uniforms, languages etc.
- Reliability – Ability of the firm (hospital) to carry on the services as promised.
- Responsibility – Readiness of the company to provide the services.
- Assurance: Knowledge and courtesy of the firm (hospital) to carry the service delivery process.
- Empathy - The caring nature and ability to understand the suffering of others.

The expressions of respondents in terms of perceptions and expectations were recorded in a five-point Likert Scale ranging from entirely disagree to entirely agree and was used for empirical analysis. The coding of the Likert scale was made as [1 = strongly disagree], [2 = disagree], [3 = neither agree nor disagree], [4 = agree], [5 = entirely agree].The total samples taken were 180 (60 from each hospital) conducted through non-probability convenience sampling. The target population belonging to category A, B and C of New Socio-economic Classification 2011as developed by Media Research User Council that takes number of consumer durables and education of chief wage earner into account, were considered for the study.[10]

RESULTS

Demographic profile:

The demographic profiles of the respondents were

collected and analyzed. Majority of the respondents were male (71.11%). Nearly two-third of the respondents belonged to urban areas and majority of belonged to the SEC A (60%). Age wise, older patients participated and responded more to the questionnaire when approached. More than 85% of participants had the education level of HSC or above. Almost 50 percent of the respondents (i.e. 47.78 percent) were married with children and next in the order were older couple who stayed alone. When the monthly household income was considered, more than 75% of population was found to have monthly income Rs. 20000/- or more. As regards to the type of visit 63.89% of the respondents were revisiting the hospitals and average spending per visit to a hospital was Rs. 5000/- or more for more than 50% of the respondents.

Reasons for availing health care in a particular hospital:

While choosing hospitals for availing the health care services, the major deciding factor was quality of services provided by them followed by hospital reputation, range of services offered, professional advice and convenience of the patient. Cost of the treatment was the least deciding factor wile choosing any particular hospital (Figure 1).

The SERVQUAL Statements:

Gap scores analysis between the expectation and perception levels of the customers revealed considerable gaps between the two (Table 1). Across the five segments, upon various parameters, the highest amounts of gaps between the perception and expectation levels were found as follows.

- Higher Costs of the treatments available
- Unresponsive nature of the doctors and paramedical staff members
- Absence of any feedback / complaint registration systems
- Unavailability of essential services in odd hours of operations
- Rude behaviour by the doctors and staff
- Longer waiting time for availing the services

Dimension wise, highest gap score was found for the empathy of doctors and staffs followed by responsiveness, reliability, assurance and tangibility (Figure 3).

Overall Satisfaction towards the hospital:

When asked about the satisfaction level (Figure 2), 42.78% patients gave a relatively positive feedback (somewhat satisfied) whereas 23.89 percent gave relatively negative satisfaction scores (somewhat dissatisfied). About 10.00 percent of people remained neutral by not giving any specific satisfaction remark.

Concern towards the Pricing of various services:

Taking affordability into consideration almost three-quarters (72.77%) of the patients opined the treatment procedure to be either expensive or very expensive and only 27.22% of the respondents said them to be reasonable or cheap.

Assessment of Attitudinal loyalty:

An attempt to capture the loyalty levels towards the hospital, showed get a relatively positive attitude of people towards them and they believe the services offered to be quite good, but in case of change of residence, they were not ready to avail the services from the same hospitals (Table 2).

Table 1: Gap Analysis of SERVQUAL dimensions

Parameters	Quality Statements	Mean Expectations	Mean	Gap Analysis
	Courteous and friendly behaviour of Doctors and staffs	4.18	2.95	1.23
	Wide spectrum of knowledge possessed by the doctors	4.35	3.32	1.03
	Treatment of patients with dignity and respect	4.15	2.86	1.29
	Thorough explanations to Patients about their conditions	4.29	2.8	1.49
Assurance	Mean	4.24	2.98	1.26

Cont... **Table 1: Gap Analysis of SERVQUAL dimensions**

Empathy	Feedbacks from the patients	4.32	1.88	2.44
	Round the clock availability of services	4.14	2.28	1.86
	Patients' best interests at heart	4.25	2.35	1.9
	Understanding about the specific needs of patients	4.22	3.37	0.85
	Personal attention given to the patients	4.11	2.42	1.69
	Patients are dealt in a caring fashion	4.22	2.15	2.07
	Mean	4.21	2.41	1.8
Reliability	availability of Services in the appointed time	4.26	2.95	1.31
	Carrying out the services accurately	4.22	3.37	0.85
	Professional and competent doctors and staffs	4.2	3.58	0.62
	System of error free and fast retrieval of documents	4.12	2.8	1.32
	Cost of treatment and consistency of charges	4.2	1.52	2.68
	Mean	4.2	2.9	1.3
Responsiveness	Provision of prompt services	4.34	1.88	2.46
	Responsiveness shown by doctors and staffs	4.32	2.88	1.44
	Attitude of doctors and staff that instil confidence in patients	4.22	3.35	0.87
	Waiting time not exceeding one hour	4.17	2.6	1.57
	Mean	4.26	2.68	1.58
Tangibility	Up-to-date and well-maintained facilities and equipment	4.37	3.14	1.23
	Clean and comfortable environment with good directional signs	4.26	3.6	0.66
	Neat appearance of doctors and staffs	4.17	3.09	1.08
	Mean	4.26	3.28	0.98

Table 2: Attitudinal Loyalty Scoring

Sl.	Statements	Mean Scores
1	I consider this hospital's services are good	4.12
2	This hospital's services are better than those of other hospitals	4.03
3	In general, the quality of this hospital's service is high	4.08
4	I will say positive things about this hospital	4.15
5	I will recommend this hospital to someone who seeks my advice	4.12
6	I will encourage my friends and relatives to undergo medical treatment in this hospital	4.17
7	I consider this hospital as the first choice for medical treatment	4.09
8	I will do all medical treatments in this hospital in the future	3.65
9	I will continue my medical treatment in this hospital, in case I change my residence to any other locality	2.94
10	In every visit, I find better quality in this hospital's service	3.18

Table 3: Things we need to look upon

Sl.	DISLIKES / GRIEVANCES ABOUT THE HOSPITAL	Percentage
1	Waiting time for availing health care and associated services	55
2	Absence of feedback & grievance handling mechanisms	51
3	Rude Behaviors of Doctors and Staffs	46
4	Unavailability of equipments (Essentials and Regular)	45
5	Inefficient medical record keeping / retrieval system	42
6	Unavailability of experienced doctors & Specialists	42
7	Unavailability of Ambulance at the time of need	42
8	Uncontrollable Crowding at key places like the OPD Units, OT, medicine outlets and testing labs	41
9	Improper lab tastings (Delay & Chaos in obtaining, processing, & publication of reports)	35
10	Unavailability of round the clock services and irresponsive nature of staffs in odd hours of operations	34
11	Inadequate facilities / amenities for patient's attendants	33
12	Informal / longer procedures of discharging after treatment / death / post-mortem procedure	32
13	Improper attention towards the indoor patients	27
14	Improper functioning of specialist information system in the premises (Where to go and whom to consult?) for the patients	26
15	Inadequate / Inconvenient and unsafe parking places	22

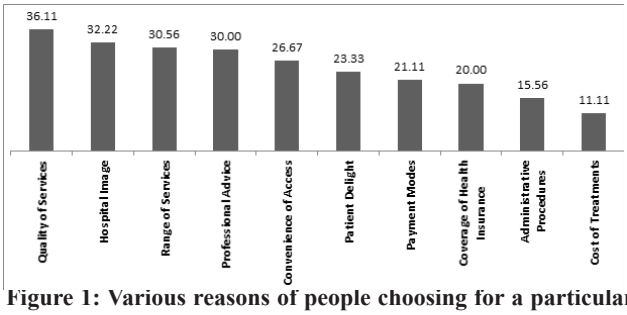

Figure 1: Various reasons of people choosing for a particular hospital

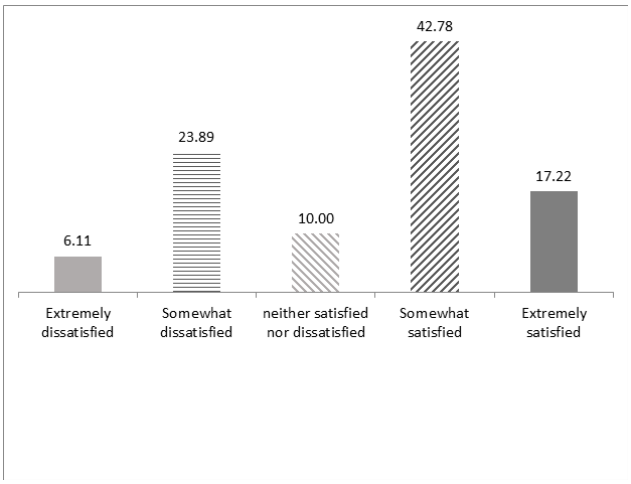

Figure 2: Satisfaction scores

DISCUSSION

Service encounter is the core phase of a service delivery process. Service quality, customer satisfaction as well as loyalty have become the three cornerstones of success in gaining competitive advantage in the market.[11] Service quality is a criterion of superior offerings which is associated with increased customer satisfaction, further translated into loyalty and repeat purchase intentions that ultimately leads to increased market share of the service provider.[12,13,14] For that we need to ensure a pleasant and hassle free service experience by real-time follow-up and by extending a warm relation with the customers. In the long run, quality of services helps in creating the brand image of the service provider.[15] It can also be defined as the difference between expectations and perceptions of the customers before and after availing the products / services.[9] Due to the difficulty of evaluation, normally we take note of the perception of the customers rather than depending on the technicality of the services in healthcare system.[8,9]

If efficiency of hospitals will be promoted and used sincerely, medical tourism can provide a country the financial boost by increasing the inflow of funds as well as it can provide the necessary help towards the local

health care industry. Similarly, to compete on a global scale, we need to improve the infrastructure, quality and service delivery process in the hospitals in order to gain sustainable competitive advantage.

For measuring the perception of customers, there are many suggested models to capture the data amongst which the SERVQUAL scale developed by Parsuraman, Zeithamal and Berry has become the major yardstick in recent times. It measures the gap between the perception and expectation levels of the customers.[8,9,16-20] Over the years, many researchers have tested the applicability of the scale and found it to be a valid, robust, reliable, and predominate over all other types of scales.[21-23]

With open ended questions, it was revealed the fact that, caring attention, availability of round the clock services, use of modern / efficient technology & equipments has to be placed effectively in order to increase the efficiency of hospital services. The views of the reference groups also play important role forming the opinion towards betterment of the health care services. Constant touch with customer should be kept by taking feedback on a neutral basis while respecting their opinions and taking them empathetically. The communication can give us ideas about the areas requiring improvement and our true state of existence.

Doctors and paramedical staffs are normally well respected by the patients and their relatives. Therefore any types of negative, abusive and rude behaviour shown by the health care providers should be avoided. The emotional nature of both the service providers and recipients should be tackled carefully to make the health care delivery smooth and pleasant.

Stringent administrative measures should be taken to ensure smooth flow of activities to prevent delays both in imparting treatment and completing other procedures and formalities. Rest shades, dormitories, provision of clean drinking water, food at affordable costs etc. are some of the measures which can be taken care of for the attendants. The security aspect has to be looked upon seriously to mitigate the hazards from both the installed facilities (equipments, infrastructural facilities) as well as human elements (thieves, drunkards, goons etc.)

Infrastructural facilities have to be bolstered like provision of help desk, clear signage & multilingual directional boards, ambulance services, elevators (where it is required), convenient & safe parking places etc. to improve upon the patient care. Recruitment and proper training of more manpower in the system can give many hands and brain in providing optimum levels of services.

CONCLUSION

Medical tourism is the next big thing in the global tourism sector. As the health care industry of a country helps to develop a healthy human capital, it needs special attempts and attention from all the stakeholders. Therefore the current status of existing health care facilities should be assessed repeatedly, analyzed and necessary steps should be taken promptly to improve the overall quality of services to facilitate medical tourism in the state.

Conflict of Interest: NIL

Source of Funding: Self

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The Potention of Chicken Egg Shell (*Galus galus domesticus*) as Mercury Adsorbent for Blood Cockle (*Anadara granosa*) by Stirring Chamber Engineering

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ABSTRACT

Blood cockle (*Anadara granosa*) was a type of clam that is widely consumed by society especially people who lived in coastal area incuding Surabaya. The mercury (Hg) level in blood cockle clam became a health problem for human who consumed it. The examples of mercury effect to human health was the case of Minamata Disease in Japan and Muara Angke case in Jakarta which caused several victims. The type of this research was experiment with one group pre-post test design. The object of this research was chicken egg shell that used such as adsorbent in stirrinng chamber. Stirring chamber was a food hygiene tool which can decrease mercury level in blood cockle using stirring principle. Samples were taken using purposive technique with five replication. The level of adsorbent which was used were 25 grams, 50 grams, and 75 grams in a liter of water then stirred for 15 minutes, 30 minutes, and 45 minutes using stirring chamber. Results showed that the level of mercury in blood cockle were reduced along with the increasing of the adsorbent dosage and the stirring duration. The highest number of mercury reduction were in the longest duration of stirring (45 minutes) with the highest dosage of adsorbent (75 grams). The level of mercury content in blood cockle which reduced were 0.545 ppm (93.64%) from 0.582 ppm before treatment into 0.037 ppm after treatment. The conclusion was the longer duration of stirring and the higher adsorbent dosage would be the lower level of mercury in blood cockle. It was recommended to the society to stirr blood cockle using chicken egg shell adsorbent before it was cooked. The next research about reducing mercury level can be done by adding another variables such as temperature, stirring speed, and adsorbent diameter variant to know the effective way to reduced mercury level in blood cockle.

Keywords: *Blood cockle, Mercury, Stirring chamber, Chicken egg shell*

INTRODUCTION

Anandra Granosa was sea creature which has economical value because of its nutrition. Those potention make blood cockle was one of seafood which popular in Indonesian restaurants.(1). But unfortunately, the contamination of heavy metals in blood cockle need to beware to prevent the health disorders which may appear. A control for food quality is needed based on the standard regulations. Based on SNI No. 7387 2009 the maximum limit of Mercury (Hg) in blood cockle was 1 mg/kg, it means only 0.1 mg Mercury (Hg) which allowed in every 100 grams of blood cockle samples. But even in this level of Mercury contamination, the blood cockle still should not be consumed continously.

Those limit only as a consument guide to estimate the toxic level of mercury contamination in food in period of time. However, any level of mercury contamination will still give negative impact for human health. Toxic effects which appeared because of mercury contamination in food are damaging body organs and also can cause death. As it happened in Japan called Minamata cases. So the accumulation of mercury must be our concern.

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Based on WHO, the threshold value of mercury level in blood was 5µg/l -10 µg/l.[2] Kenjeran is a coastal area located in Surabaya city. The pollution of mercury in Kenjeran comes from mercury contamination from some rivers that come down to there. The water in coastal area of Kenjeran has been polluted by heavy metal mercury (Hg), cromium (Cr), cadminum (Cd), and cobalt (Co), fish in Kenjeran also have been contaminated by mercury and crominum.[3] The contamination of mercury in blood cockle was 0.032 mg/kg dried weight in blood cockle's muscle and 0.01615 mg/kg dried weight in blood cockle's gill which taken from Kenjeran area.[4]

This study would use chicken egg shell to decrease the level of Hg in blood cockle (*Anadara granosa*). Chicken egg shell will be used because it was easy to be found, and also considered society assumption that chicken egg shell was a waste so it needed to be exploited its benefits rather than just throw it away as a garbage.

The use of chicken egg shell usually found as handycrafts and as adsorbent for water. The content of chicken egg shell was 98.5% of $CaCO_3$, 0.85% Magnesium carbonate, and mostly contain organic matter. These was the reason we choose chicken egg shell as adsorbent to minimize mercury in blood cockle. Beside its content, pores in chicken egg shell have potention to be used as adsorbent. The larger of chicken egg shell surface, the more pores in there. It means the larger surface of chicken egg shell the more substances that can be adsorbed. Surface area of the adsorbent is determined by the size of the particles and the amount of adsorbent.[5]

Adsorption process while binding some compounds in a solution affected by contact time. Syauqiah, et al.[6] conclude that the more contact time the more amount of Fe which decrease because the adsorption process work better. This principle then becomes the background if contact between adsorbent and asorbat done using striing then it will increase adsorption process in a solution.

The rate of adsorption affected by film diffusion and pore diffusion, and also stirring factor.[7] Adsorption limited primarily by film diffusion and pore diffusion process, depend with the amount of movement in its system.[8] If the movement in stirring process relatively low, it makes film layer around the adsorbent will be thick and decrease the adsorption process. Otherwise if the stirring process is enough the rate of film diffusion will increase. This underlise the writer to combine adsorption process in a tool that has principal to increase adsorption rate to decrease the level of mercury in blood coockle.

This study aimed to analyze the potention of chicken egg shell as an adsorbent to decrease the level of Hg in blood cockle using engineering tool Stirring Chamber.

MATERIAL AND METHOD

This research conducted by using pre experimental design. The presence of the effect will be used as a base to achieve the aims in this research which to know the effect of chicken egg shell as an adsorbent using stirring chamber tool to decrease the level of Hg in blood cockle (*Anadara granosa*). This research conducted using one group pretest-posttest design. This design use only a group of subject which be given a treatment (X), the level of Hg then will be measured before treatment (O1) and after treatment (O2), the result will be known more accurate because we can compare the level of Hg before and after treatment. The design form can be seen above:

The Pre-test	The Treatment	The Post-test
O1 ---------- >	X	---------- > O2

The independent variable of this studi was stirring duration process and adsorbent dosage. Stirring was done for 15 minutes, 30 minutes, and 45 minutes. While the adsorbent dosages were 25 grams, 50 grams, and 75 grams. Replication was calculated using Federer formula $(K - 1)(r - 1) \geq 15$, so there would be four replications in each treatment. But this research used five replication. The dependent variable was the level of Hg in blood cockle. The mechanism in this research was implemented in two stage (the preparation stage and the process stage). The mechanism is described in diagram below.

A. STAGE I : PREPARATION OF THE EXPERIMENT

THE PRODUCTION OF ADSORBENT

This production of adsorbent is described schematically in the Figure 1 below.

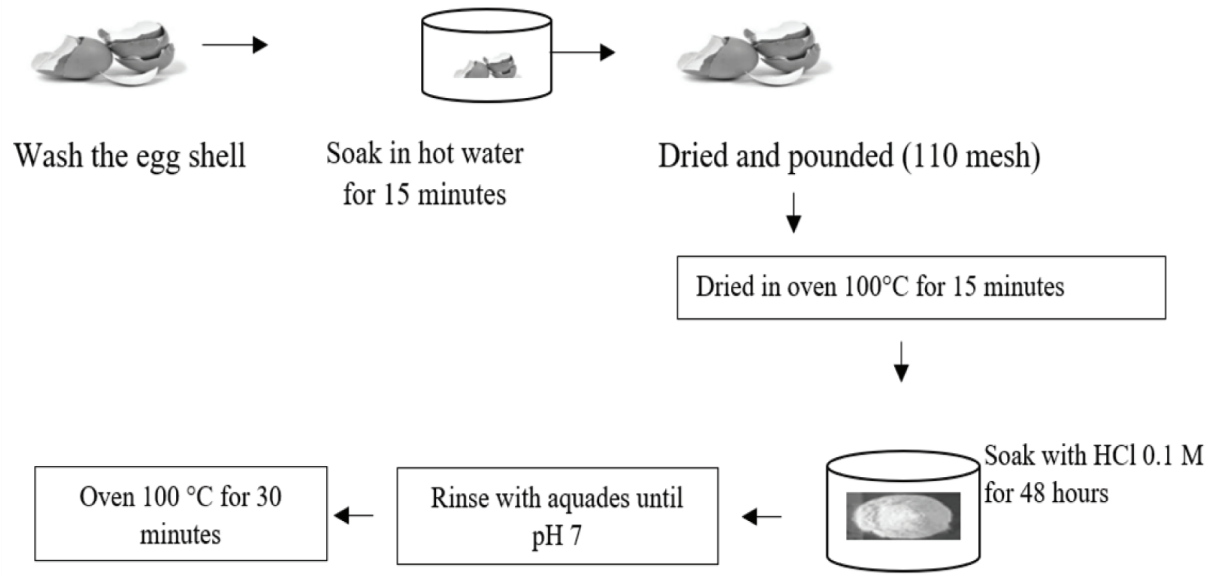


Figure 1. The Production of Adsorbent

B. THE PRODUCTION OF SOLUTION

This production of solution is described schematically in the Figure 2 below.

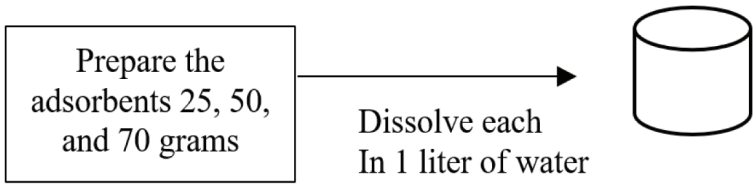


Figure 2. The Production of Adsorbent

STAGE II: THE PROCESS OF EXPERIMENT

The process of experiment is described schematically in Figure 3 and Figure 4 below.

1St REPLICATION

1St GROUP : Without adsorbent and stirring process.

1. KR_1 = for 15 minutes (without the treatment)
2. KR_1= for 30 minutes (without the treatment)
3. KR_1= for 45 menit (without the treatment)

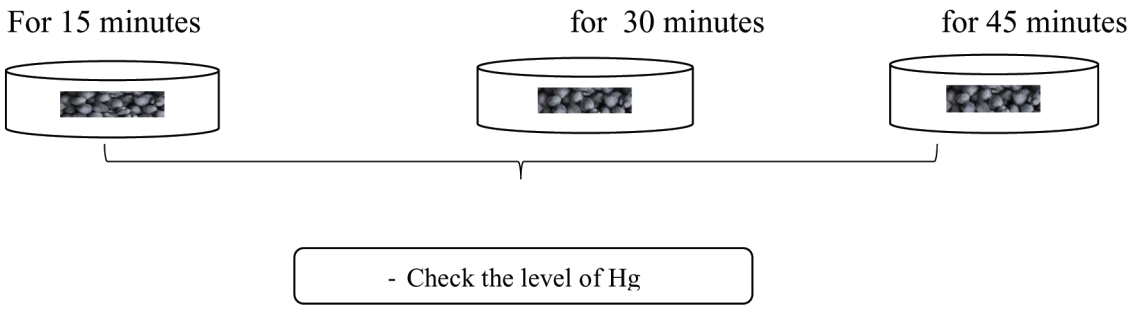


Figure 3. The Experimental Process in The First Group Performed Without Adsorbent

2nd GROUP: With adsorbent and stirring process

A. 1st REPLICATION

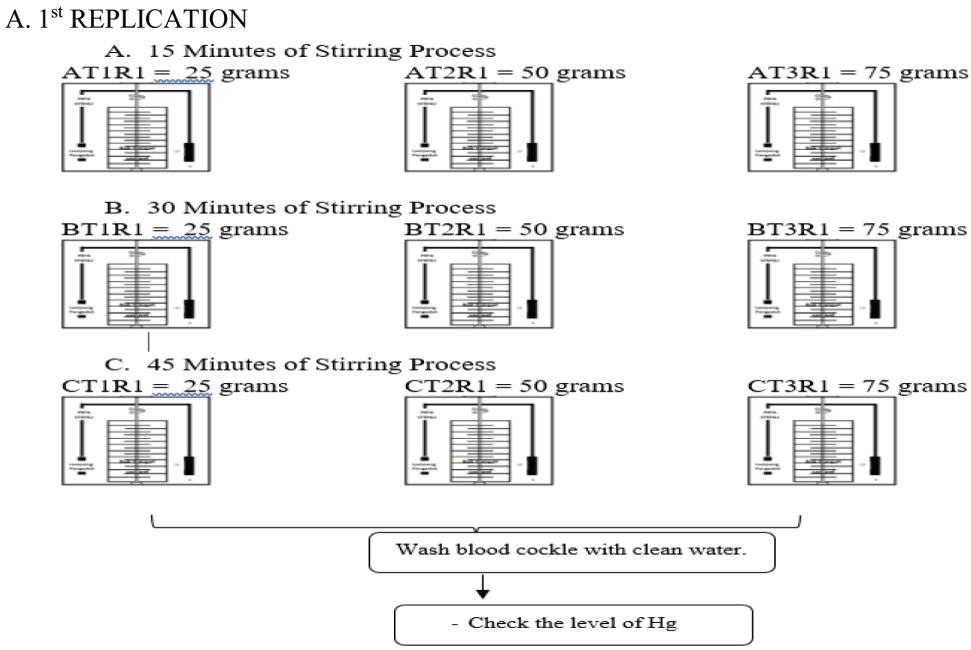


Figure 4. The Experimental Process in The Second Group Performed with Adsorbent and Stirring Process

The information :

K = Control

A, B, C = Stirring Duration (for 15 minutes, for 30 minutes, and for 45 minutes).

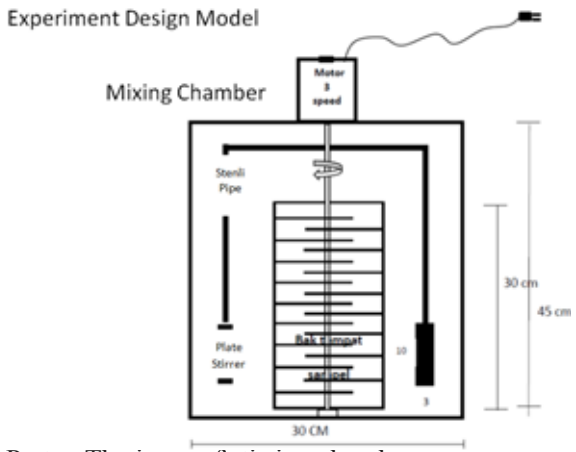
$T_{1,2,3}$ = Adsorbent dosage (25 grams, 50 grams, and 75 grams).

$R_{1,}$ …. = 1st replication, 2nd replication, ...

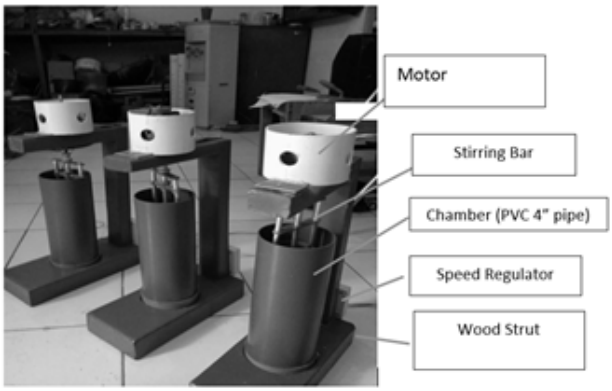
The 2nd until 5th replication would be done same as 1st replication.

Stirring Chamber Model

The anatomy of both inner and outer stirring chamber is shown in detail in Fig. 5 a and b.



Part a: The inner of stirring chamber



Part b: The outer of stirring chamber

Figure 5. The Stirring Chamber

RESULTS AND ANALYSIS

a) The Average Results of Hg in Control Group: KA = 0.661 ppm, KB = 0.616 ppm, KC = 0.581 ppm.

b) The Average Results of Hg in Before and After of The Treatment.

Table 1. The Hg Level as The Results of The Experiment

The Sample's Code	Average of Hg Level		Differences	Percentage
	Before	After	(ppm)	(%)
AW1	0.661	0.532	0.129	19.52
AW2	0.616	0.357	0.259	42.05
AW3	0.582	0.24	0.342	58.76
BW1	0.661	0.248	0.413	62.48
BW2	0.616	0.214	0.402	65.26
BW3	0.582	0.132	0.450	77.32
CW1	0.661	0.244	0.418	63.16
CW2	0.616	0.162	0.455	73.78
CW3	0.582	0.037	0.545	93.64

Description :

A, B, C = Stirring Process with Duration: 15 minutes, 30 minutes, and 45 minutes.

$W_{1,2,3}$ = Adsorbent dosage: 25 grams, 50 grams, and 75 grams.

The highest number of average difference of Hg reduction was CW3 sample (45 minutes stirring duration and 75 grams adsorbent dosage) with the average difference was 93.64 ppm (93.64%). While the lowest differemce of Hg was AW1 sample with 19.52 ppm (19.52%) reduction. The more duration of stirring process and adsorbent dosage affect the Hg reduction higher. Two way anova analysis showed that stirring duration and adsorbent dosage has sig. 0.00<0.05, which means there were a significant effect of stirring duration and adsorbent dosage to the Hg reduction in blood cockle.

Table 2. The Results of Anova

Dependent Variable: The Hg Level					
Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Corrected Model	3.088[a]	11	0.281	1210.954	0.000
Intercept	6.659	1	6.659	28727.765	0.000
Stirring_Duration	1.133	2	0.567	2444.323	0.000
Adsorbent_Dosage	1.728	3	0.576	2484.093	0.000
Stirring_Duration * Adsorbent Dosage	0.227	6	0.038	163.261	0.000
Error	0.011	48	0.000		
Total	**9.758**	**60**			
Corrected Total	3.099	59			
a. R Squared = .996 (Adjusted R Squared = .996)					

Description :

1. Corrected Model: Sig. value 0.000 (<0.05), showed that there was an effect of independent variable (Stirring duration and chicken egg shell adsorbent dosage) to Hg level in blood cockle.

2. Stirring Duration: Sig. value 0.000 (<0.05), showed that there was a significant effect of stirring duration to the Hg level in blood cockle.

3. Adsorbent dosage: Sig. value 0.000 (<0.05), showed that there was a significant effect of adsorbent dosage stirring to the Hg level in blood cockle.

4. Stirring duration* Adsorbent dosage: sig-value 0.000 (<0.05), showed that there was a significant effect of stirring duration and adsorbent dosage to the Hg level in blood cockle.

5. R Squared = 0.996 → strong corelation.

CONCLUSION

1. The results of Hg level difference in blood cockle before and after treatment based on stirring duration and chicken egg shell adsorbent dosage using stirring chamber described above:

a) The average difference of Hg level in blood cockle using 15 minutes stirring duration with 25 grams adsorbent dosage was 0.219 ppm (19.52%), with 50 grams adsorbent dosage was 0.259 ppm (42.05%), and with 75 grams adsorbent dosage was 0.342 ppm (58.76%).

b) The average difference of Hg level in blood cockle using 30 minutes of stirring duration with 25 grams adsorbent dosage was 0.413 ppm (62.48%), with 50 grams adsorbent dosage was 0.402 ppm (65.26%), and with 75 grams adsorbent dosage was 0.450 ppm (77.32%).

c) The average difference of Hg level in blood cockle using 45 minutes stirring duration with 25 grams of adsorbent dosage was 0,418 ppm (63.16%), with adsorbent dosage 50 grams was 0.455 ppm (73.78%), and with 75 grams adsorbent dosage was 0.545 ppm (93.64%).

2. There were effect of stirring duration and chicken egg shell as adsorbent dosage to the level of Hg in blood cockle.

RECOMMENDATION

1. Stirring chamber need a better design with stronger and more solid materials to prevent damages while experiments. Repairing the damages needed to prevent another unspesific effect to the samples.

2. Advanced research to analyze another variables which might affect the Hg level in blood cockle are needed, another variables for example temprature, pH, stirring speed, or adsorbent diameter. Modification can be done to the stirring chamber such as heater and speed regulator. Modification to the pH solution also can be another option in order to increase effectiveness to reduce Hg level in blood cockle.

Conflict-of-Interest, Source of Funding and Ethical Clearance: The authors declare that there is no conflict of interest in this research. All funds of this research comes from the authors. This research has passed in ethical assessment at Health Polytechnic of Ministry of Health at Surabaya.

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The Effect of Chayote (Sechium Edule) on Blood Glucose Level of High School Teachers of Pre-Diabetes

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ABSTRACT

Background: Prediabetes can increase the risk of cardiovascular disorders by 1.5 times higher than healthy people. Prevention efforts by changing lifestyles and losing weight provision of a chayote (sechium edule) instant

Objectives: The objectives of the study were to analyze the effect of chayote (sechium edule) instant on blood glucose of high school teachers of prediabetes.

Method: This research was quasi-experimental study with pre-post control group design. The number of research samples was 25 for the intervention group, given provision of a chayote (sechium edule) instant (SE) and 25 for the intervention group were given nutritional education (NE) and 25 groups of nutritional education interventions and provision of a chayote (sechium edule) instant (NE+SE) for 30 days. Normality test using Shapiro-Wilk, Statistical analysis using Wilcoxon Signed Ranks Test and multivariat of varians and Games-Howell test.

Results: There were no difference of blood glucose before and after intervention in SE groups ($p < 0.05$) in the provision of a chayote (sechium edule) instant intervention group decreased blood glucose levels by 6,32 ± 22,094 gr/dL; there were no difference of blood glucose before and after intervention in NE groups ($p < 0.05$) in nutrition education training intervention group increased blood glucose levels by 10,08 ± 52,52 gr/dL; there were a difference in blood glucose before and after intervention in NE+SE groups ($p<0,05$). in NE+SE intervention group decreased blood glucose levels by 26,52 ± 23,63 gr/dL. There were a difference in blood glucose levels after intervention in third groups($p<0,05$), and which has statistically significant differences in blood glucose levels were in the intervention NE group with intervention NE+SE group.

Conclusion: The administration of Nutrition education training and provision of a chayote (sechium edule) instant significantly decreased blood glucose levels in treatment group.

Keywords*: nutrition education, sechium edule, blood glucose, prediabetes*

INTRODUCTION

Increased prevalence of degenerative diseases such as Diabetes Mellitus (DM) in developing countries is due to increased prosperity and lifestyle changes. Research conducted by the Diabetes Prevention Program states that about 11% of people with prediabetes will develop into type 2 DM on average after three years. Other research suggests that many people with prediabetes will develop into diabetes after ten years. However, prediabetes is a manageable condition[1-3].

IDF in 2011 has predicted that by the year 2030 there are 398 million world population experiencing

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prediabetes. Results of Basic Health Research in 2007 showed that the prevalence of type 2 DM in urban areas in Indonesia was 5.7%, while the prevalence of prediabetes was almost twice that of 10.2%. If the estimated prevalence of Type 2 DM increases, the prevalence of prediabetes will increase higher because of the number of cases such as the iceberg phenomenon in which the number of individuals not detected DM type 2 (including prediabetes) more than type 2 DM. [4-6].

Treatment of prediabetes and diabetes uses propolis [7] and plant extracts has been widely used since ancient times in various countries, including: cassia abbreviata [8], aloe vera plant[9], button flower [10], *Gymnema Sylvestre leaves,* [11,12], root plant [13], *Fenugreek* plant [14] and squash[15].

Siamese pumpkin is a plant containing glycosides, alkaloids, cucurbitacin, flavonoids, polysaccharides, and saponins that are thought to be efficacious as anti-diabetic. Based on research Qu D (2014) the inflammatory process is strongly associated with the onset of DM. It has been found that IL-6 levels are very high in patients with DM and suspected IL-6 is the trigger of DM emergence through the inflammatory process [16].

This research aims to analyze the effect of chayote (sechium edule) instant on blood glucose of high school teachers of prediabetes

MATERIALS AND METHOD

Research type

The type of this research was quasi experiment with randomized trial design, pretest posttest with control group. Randomized trial is the division of research subjects into specific groups done randomly, using simple random sampling. Prediabetes SMAN (Senior High School) teachers who fulfilled the inclusion criteria in the three groups at random. The first group received an instant gourd intervention (LS), the second group received nutritional education (EG) intervention and the third group received nutritional education and instant gourd (LS + EG) interventions. Respondents were given 30-day intervention on each subject. Blood glucose levels measured before and after intervention.

Time and Location Research

This research was conducted in the period of 6 months, April 2017 - September 2017. It was conducted in SMA in eight sub-districts in Palu City.

Sample

High school teachers with civil servant status in the city of hammer who experienced prediabetes as many as 25 pre-diabetic teachers for each group, so for three groups required 75 prediabetes teachers.

Intervention Group

The first group with Instant Pumpkin Intervention, ie each respondent is given instant gourd as much as 15 mg of morning and 15 mg afternoon given every day for 30 days. The second group with nutritional education intervention, ie each respondent is given training and knowledge about food intake of prediabetes sufferer. Third group with Nutrition Education intervention and instant gourd feeding, each respondent is given instant gourd as well as training and knowledge about food intake of prediabetes consuming instant gourd pump.

Data Analysis

Univariate analysis to examine data on respondent characteristics and blood glucose levels in all three intervention groups. Normality tests were performed for variables with numerical data using the Shapiro-Wilk test. Bivariate analysis of blood glucose levels before and after intervention by using the Wilcoxon Signed Ranks Test and independent t test / Mann Whitney to test intergroup treatment. While the one way Anova/ Kruskal Wallis test was conducted to determine the effect of treatment or intervention of three groups on blood glucose level at the time.

RESULTS

Blood glucose levels in time
In general, the sample was classified as prediabetes with a blood glucose level of at least 100 g/dL, a maximum of 191 g/dL and a mean of 122.63 ± 21.80 g/dL. Blood glucose level before the lowest average intervention was the intervention group of squash while the highest was the intervention group of nutrition education training and consumption of squash.

Table 1. Description of GDS levels in each group

Variables	Intervention Group			Nilai p
	Instant gourd pumping	Nutrition education training	Training of nutrition education and provision of instant gourds	
Levels of GDS Before Intervention Minimal Maximum Mean Standard Deviation GDS Level After Intervention Minimal Maximum Mean Standard Deviation	 101 191 121.68 24.804	 100 163 121.72 19.78	 100 178 124.48 20.801	0.503*
Levels of GDS Before Intervention Minimal Maximum Mean Standard Deviation GDS Level After Intervention Minimal Maximum Mean Standard Deviation	 79 234 115.36 38.506	 79 259 131.80 51.903	 60 150 97.96 18.705	0.032*
P value	0.170**	0.775**	0.000**	
Δ Kadar GDS Minimal Maksimal Mean Standar Deviation	 -45 46 6.32 22.094	 -154 81 -10.08 52.521	 -15 74 26.52 23.633	0.002***

Source: Primary data 2017

Note: * *Kruskal Wallis Test*, ** *Wilcoxon Signed Ranks Test, ***One way anova test*

The result of normality test of GDS level before and after intervention in the intervention group of pumpkin was not abnormal distribution, then the level of GDS before and after the intervention was done transformation of data and the result of GDS level before and after intervention remain abnormally distributed so Wilcoxon Signed Ranks Test. Wilcoxon Signed Ranks Test results showed no significant differences in GDS levels before and after intervention in the instant infusion group (p> 0.05). This suggests that the provision of instant gourd for 30 days may decrease GDS levels of prediabetes high school teachers.

The result of normality test of GDS level before and after nutrition education training intervention was not normal distribution, then the level of GDS before and after intervention is done transformation of data and the result of GDS level before and after intervention remain abnormally distributed, so tested Wilcoxon Signed Ranks Test. Wilcoxon Signed Ranks Test results showed no significant differences in GDS levels before and after intervention in the nutrition education training intervention group (p> 0.05).

The result of normality test of GDS level before nutrition education training intervention and giving instant gourd distributed is not normal, then GDS level before intervention is done transformation of data and the result of GDS level before intervention remain abnormally distributed, so Wilcoxon Signed Ranks Test. Wilcoxon Signed Ranks Test results showed significant

differences in GDS levels before and after intervention in the nutrition education training intervention group and administered instant gourd ($p < 0.05$). This suggests that nutrition education training interventions and the provision of instant gourds can lower GDS levels of prediabetes high school teachers.

The result of Kruskal Wallis test of GDS level before intervention with significant value was 0.503 ($p > 0.05$), it was concluded that there was no significant difference of GDS level before the third group intervention. Level of GDS after intervention with significant value of GDS was 0,032 ($p < 0.05$), it was concluded that there was significant difference of GDS level after intervention of three groups. Which intervention groups differed significantly between the three groups, then Post hoc tests were performed using the Mann Whitney test. Mann Whitney test results showed levels of GDS after intervention based on the three interventions that had statistically significant differences in GDS levels in the intervention group of instant gourd feeding with nutrition education training intervention group as well as provision of instant gourds and nutrition education training intervention groups with training intervention training group nutrition as well as the provision of instant gourd ($p < 0.05$).

The result of one way anova test for GDS change obtained by significant value was 0,002 ($p < 0,05$), it was concluded that the three intervention groups significantly influence the change of GDS level of prediabetes high school teacher. Games-Howell test results showed changes in levels of GDS based on the three interventions that have a statistically significant difference in changes in levels of provision of GDS in the intervention group and intervention group chayote nutrition education training at the same time giving instant chayote ($p < 0.05$). Table 2 shows statistically significant differences in GDS changes in instant gourd infusion with nutrient education training and provision of instant gourds and nutrition education training with nutrition education training and instant gourd feeding ($p < 0.05$). Nutrition intervention training group as well as giving instant gourds have a significant influence in decreasing levels of GDS (on average).

Table 2. Changes in GDS Levels among the Three Intervention Groups

Comparison between types of interventions	P value
Giving instant gourd with the training of nutrition education	0.333
Provision of instant gourd with instant nutrition training and instant gourd feeding	0.008*
Nutrition education training with nutrition education training and instant gourd feeding	0.009*

* Different meaningful ($p < 0.05$)

DISCUSSION

Blood glucose at the time

The subjects of the study were high school teachers with GDS 100-200 mg/dL, above normal glucose level and not yet classified as DM (prediabetes). The results showed a minimum GDS level of 100 g/dL, a maximum of 191 g / dL and a mean of 122.63 ± 21.80 g / dL. After intervention in the form of instant gourds, nutrition education training and combined training of nutrition education and provision of instant gourd, there is a decrease in GDS levels. The decrease in GDS in the LS intervention group was 6.32 points. However, statistically Wilcoxon Signed Ranks Test results showed no significant difference in GDS levels before and after intervention in the LS intervention group ($p > 0.05$.

The high calorie and carbohydrate content of the squash showed the level of starch or crude fiber based on sugar increased. As a result, the high fiber content causes the cone squash accordingly, to control food intake and blood glucose levels[17,18].

Reported by [19] by feeding rodents of pumpkin juice for 3 months not only prevents the development of glucose tolerance disorders but also significantly prevents the development of oxidative stress through the antioxidant activity in the blood. Furthermore, treatment with pumpkin juice in mice for 15 days can normalize blood glucose, reduce oxidative stress, increase platelet levels and hemoglobin. The content of flavonoid and saponin compounds in siamese gourds is responsible for its activity which significantly reduces blood glucose levels by insulin formation by pancreatic β-cells[19,20].

The results of meta-analysis show that nutritional education is one of the prevention programs of DM or associated with decreased risk of DM[21,22]. Another

study showed a nutrition education intervention group evaluated for 12 months with anthropometric and metabolic parameters, obtained significant weight loss of 3.4%, BMI of 5.7%, blood cholesterol of 23.0%, fasting blood glucose level of 14.0%, fasting insulin at 9.0% and hemoglobin at 24.0%. Significant nutritional education can improve anthropometric and metabolic meters, so nutritional education is an alternative in treating the risk of incident type 2 DM[23].

CONCLUSION

The mean change of GDS in the intervention group decreased, ie in the intervention group of 6.32 g / dL and in the nutrition education intervention group and the provision of the squash was 26.52 g / dL, while in the nutrition education training intervention group increased of 10.08 gr / dL. The difference in GDS changes between the three intervention groups was significant ($p < 0.05$), meaning that the three intervention groups significantly affected the change in GDS levels.

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Identification of Spectral Graph Wavelets for Microcalcifications in Mammogram Images

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ABSTRACT

Breast cancer is one of the dangerous disease for ladies in world.The available system deals MicroCalcifications (MCs) in breast cancer and detectection is difficult till now, But using mammogram images inital stage itself idetenfication is simple as well as very easy to detect the breast cancer.In this study, The system has to identify the MCs classification by using Spectral Graph Wavelet Theory (SGWT) and K-Nearest Neighbour (KNN) classifier.To extract their energy in each sector and make them together to identify the results by using the algorithm..

Keywords- *Mammogram, Breast cancer, KNN classifier, Microcalcification.*

INTRODUCTION

Breast cancer is very dangerous disease and mainly affected by ladies even 25 years ladies also affected is the very pathadic suitation in world[1][2][17].The main moto of the system has to detect as soon as possible advances stage itself can make the patient safe as well as treatment is easy and safe so many life of the people is important for that process the mammogram image are used to process the entire system to identify the mammogram image is breast cancer or not by using the factors extraction of energy level in the image as well as identify the image is cancer or malignant image[3] [4][18].In this paper, the system has two algorithm one is for extraction of energy level another one is for the identification of feature extract data with the system[6][7].

METHODOLOGY

The proposed system is developed by two algorithms one is spectral graph wavelet another one is KNN classifier[15][16].

Spectral Graph Wavelet Theory

This is achieved using the spectral representation of the operator. In particular, for our spectral graph wavelet kernel p , the wavelet operator $T_p = p(L)$ acts on a given function f by modulating each Fourier mode[8][9].

$$Tp\hat{f}(l) = p(\lambda_l)\hat{f}(l)$$

The inverse Fourier transform is

$$(Tpf)(n) = \sum_{l=0}^{N-1} p(\lambda_l)\hat{f}(l)X_l(n)$$

The wavelet operators at scale y are then defined by.

$$T_p^y = p(yL).$$

It should be emphasized that even though the "spatial domain" for the graph is discrete, the domain of the kernel p is continuous[10][11].

KNN Classifier

In KNN classifier is just a matching algorithm with database to show whether extracted energy level from the SGWT is matched with the database to give the result is bengin or maligant for the patient[14].The KNN classifier is the second and very important stage for the entire process to give the accuracte result for the patient[12][13].

DISCUSSION

The system deals with identification of cancer from mammogram images through wavelet transformation

for that purpose to identify the microcalcification as well as mass from the images for that purpose wavelet and KNN classifier is used to detect and identify the process from open source database like MIAS database is used for the proposed system.

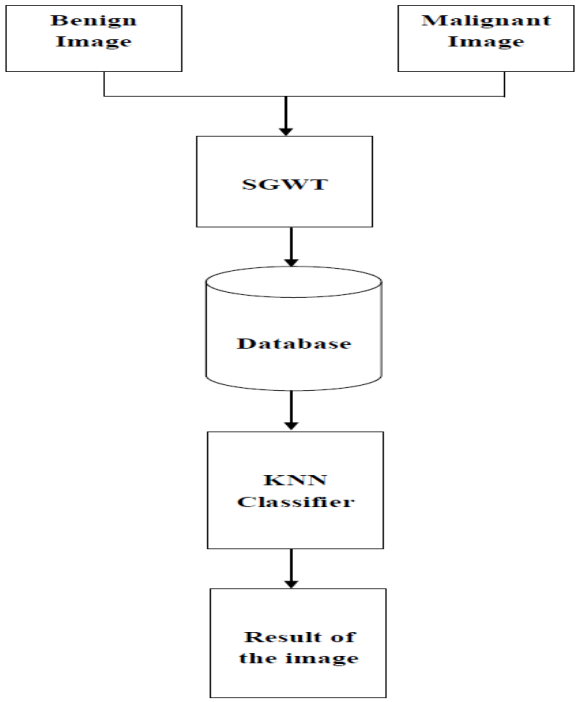

Figure.1.Basic Block diagram for proposed system

Implementation

In this system totally 136 mammogram images are taken from MIAS database for the entrie process from that 88 images are malignant and 48 images are bengin images has been find out from the proposed system[14] [15][19].

Table1. Performance of the system

SGWT	1	2	3	4	5
False (+ve)	115	116	101	112	116
True (+ve)	111	112	113	113	112
False (-ve)	112	111	110	110	111
True (-ve)	131	121	121	111	131
Sensitivity (%)	89.99	93.52	97.45	98.89	99.01

CONCLUSION

In this paper MIAS database is used for the execution of entire system and the system has totally two algorithm namely SGWT used to get the feature and KNN classifier used to match the feature with the database for the finaly result here totally 136 images taken for the process from that totally 88 images are malignant and 48 images are bengin images has been find out.

Ethical Clearance- NIL

Source of Funding- Self

Conflict of Interest- NIL

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Vitamin Deficiency as Moderator of Psychological Well being of Indian Militia: A Position Paper

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ABSTRACT

Unlike other commercial industry, the Indian militia is a challenging and volatile environment which has to adapt to new technologies and to different environments at any given point of time. Inherent and unavoidable are the occupational hazards that go in hand with the honour of serving the nation. This study is a conceptual work to establish the significance of psychological wellbeing and to check if vitamin deficiency moderates the psychological wellbeing and fortifies the individual to extinguish stress. In this attempt a conceptual model is brought out and the status quo of research on this area.

Keywords: *Psychological wellbeing, Vitamin deficiency, Indian Militia, Work stress*

INTRODUCTION

War, infiltration or cross border terrorism is always uncertainty and captivates the life of military personnel unawares. Anytime, they have to be ready both physically and mentally and for any depth of situation. Our Indian army have always risen to such situations. Though Indian Militia has not been actively taking part in any war activity recently, there had been episodes of operations to curb infiltration bids and cross border terrorism. Military personnel have been successful in adapting themselves to such temporary hardships and missions carried out under humanitarian grounds [1] In spite of extant literature on work stress of a variety of industries, research on the Indian militia is sparse to the best of our knowledge.

Unfortunately, according to the data compiled and shared by the Ministry of Defence for the period starting from January 1, 2014 to the period ending March 31st, 2017 there had been three hundred and forty eight personnel committed suicides while on duty. Among them two hundred and seventy six (276) were from the Army, twelve (12) from Navy and sixty (60) from the Air Force. In the previous four years five hundred and ninety seven (597) personnel of Army committed suicide: of which, one hundred and sixteen (116) were reported in 2010, one hundred and five (105) in 2011, ninety five (95) in 2012 and eighty six (86) in 2013. Such disgusting rate of suicides among the Indian forces has been attributed to psychological imbalance caused by work stress in the organisational climate [2]

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OPERATIONAL DEFINITIONS

PSYCHOLOGICAL WELL BEING

The renowned psychologist, Ryff conceptualizes wellbeing as the *realization of one's true potential instead of achieving subjective - happiness which is an outcome of well lived life* [3]. The meaning conveyed by Ryff is that happiness is not subjective and is the reflection of the satisfaction derived out of achieving set goals or targets by an individual. This satisfaction or well lived life reflects in the autonomy one enjoys, self-development, and self-acceptance, setting life targets, environmental control and positive relationships with others [4].

VITAMIN DEFICIENCY

At the Lister Institute, London, in the year 1911, the word *Vitamine* was coined by the then bio-chemist Casimir Funk (1884 – 1967). The suffixes A,B,C…. were later assigned in the order of their discovery except for Vitamin K, where K was derived from "Koagulation" by the Danish researcher Henrick Dam.

According to the Mosbys Medical Dictionary, Vitamin deficiency[5] is a *state of physical condition resulting from lack of or inability to use one or more vitamins.* The symptoms and manifestations of the deficiency will vary according to the type of deficiency as they have specific functions in the promotion of growth and development in the physical health of a person.

WORK STRESS

Stress is defined as *the non-explicit reflex reaction of the body to any expectation made on it*. [6] Research points out that stress are a psychological assault of the person when he feels his resources outweigh the expectations of the situation. It can result from explicit situational factors or on the contrary on the internal efficacy of the person like pessimism. Hans Selye was the person to coin the word stress as it is in vogue currently.

OBJECTIVE

The research question is if Vitamin deficiency reduces the psychological wellbeing of the Indian militia which subsequently makes them inefficient to fight back the work (place deviant behaviour) stress.

METHODOLOGY

The methodology used for the study is purely conceptual. The research database, findings and suggestions of all possible secondary data were analysed to bring out in-depth analysis of literatures on all the variables under study. The research gap was identified through this thorough study. And based on the inputs, the conceptual model is attempted which is to be tested with a following empirical study.

REVIEW OF LITERATURE

PSYCHOLOGICAL WELL BEING

The perspective of Psychological wellbeing dealt in this paper is called Eudaimonia which is accomplishment of human potential and finding satisfaction in a meaningful life. It is the capability of a person to thrive and withstand the challenges which life throws in the form of having meaningful targets, growing and developing as a person with dignity and grace while at the same time establish qualitative relationship with fellow human being [7][8][9].

Ryff, Singer and Keyes [10][11], have developed and contributed six major dimensions of this wellbeing, which are: self-acceptance, autonomy, environmental mastery, positive relations with others, purpose in life, and personal growth, which are detailed as below:

Self-acceptance: means to unconditionally accept oneself without assigning values or being judgemental. This ability is the cornerstone of mental health/stamina and emotional maturity.

Autonomy: is the ability to function independently of others approval or monitoring. As an individual it reflects on self-management skills.

Environmental Mastery: is the consequence of the ability to adapt to the situation. Mastery of our reflexes in unexpected circumstances and the competency to sustain is a rewarding quality and wealth [12].

Positive Relations with Others: This relates to ability to have flexibility in relations with others. Unless one possesses empathy, he/she cannot appreciate the opinions or the thinking styles of others. Till you don't hurt or does not get hurt by others, we are only in the progressing stage.

Purpose in Life: is not a one time on / off quality. It is a persistent seeking and ever progressing mental functioning in the positive thinking vector [13][14][15][16][17]. Only those who understand that there is purpose in life will ever be able to identify themselves of their purpose and also help other identify theirs. This quality enhances and equips anyone to face the negative encounters in life.

Personal Growth: Personal growth is the nearest to the concept of eudaimonic well-being as demarcated by Aristotle. It is the ability to perceive life as a sequence of endless changes and tasks, as occasions to enhance and endeavour towards one's true aptitudes and thereby increases the probabilities of attaining a well-lived life.

VITAMIN DEFICIENCY

Vitamins are Organic compounds. They cannot be

produced in the physical body and have to be necessarily supplemented in our daily diet. As mentioned earlier vitamin deficiency is a state of physical condition resulting from lack of or inability to use one or more vitamins. A vitamin deficiency can be the source or cause of a disease or syndrome usually known as an *avitaminosis* or *hypovitaminosis*. There are basically two forms of vitamin deficiency:

1) Primary deficiency: caused by malnutrition or balanced diet where the body does not get the enough dosage of its vitamin requirement per day.

2) Secondary deficiency : it is the result of lifestyle of an individual characterised by consumption of alcoholic beverages, use of tobacco and narcotics to mention a few.

Chronic vitamin deficiencies resulting in syndromes like scurvy (caused by vitamin C deficiency), pellagra (caused by vitamin B complex) and beriberi (caused by vitamin B_1) are rare among Indians, Vitamin A, B, B_{12} and D are quite common and are not given the due attention they need.

Various psychological symptoms are caused by vitamin deficiencies. Confusion; memory changes; delirium, with or without hallucinations and/or delusions; acute psychotic states; and (more rarely) reversible manic and schizophreniform states [18] hyperhomocysteinemia [19] depressive disorders [20] neuropsychiatric syndromes especially the methionine-synthase mediated conversion of homocysteine to methionine, which is essential for nucleotide synthesis and genomic and non-genomic methylation may have roles in the prevention of mood disorders, dementias, including Alzheimer's disease and vascular dementia [21] Ischemic stroke is also associated with low folate levels [22] are attributable to Vitamin B_{12} deficiency and anaemia.

Besides, also to be noted is the finding that vitamin D supplementation does not influence or impair the cognitive, psychological or emotional functioning in healthy young adults [23].

Vitamin deficiencies are associated with irritability, overaggressive behaviours – even in case of manifestation of marginal vitamin nurture. Humans are said to become more impulsive, aggressive and sensitive to criticism [24].

WORK STRESS

Stress isn't at all times bad. Unless there is little bit of stress, we cannot be focussed on the situation at hand. But when it becomes an emotional roller coaster with increasing demands then, such stress leads to negative and harmful effects which is exactly the situation in the army these days as it is propelling our soldiers toward deadly steps and in the course, tarnishing the image of the Indian army.

Stresses faced by armed forces are entirely different from those faced by civilians. It varies, both in the nature of the stressors and its inherent intensity. These stresses threaten emotional and psychological equilibrium of soldiers and generate the "fight-or-flight" response. The major differences are:

1. Assuming them to be mentally tough guys, their performance is discussed in a more insensitive and becomes more of a criticism.

2. The soldiers often work in isolated and high altitude places were oxygen – the very essence of existence is scarce. This affects them physically too.

3. Inability to serve their own families in case of domestic emergencies and the guilt attached to it.

4. Highly disciplined, restrictive and protocol driven life. Higher anxiety is a well-reported neurologic condition associated with vitamin B deficiency in humans [25]

5. For many of us family, relatives and friends are comforters and come to our rescue when they find us stressed. This cushion of comfort is deprived for the armed forces which is a terrible, and words cannot express their loneliness during such depressing times.

FINDINGS

The in depth literature review has helped in finding the research gap. The literature review has suggested the potential area of research for any individual investigator or researcher.

1. Vitamin B deficiency is still persistent as a cause of health concern among adults. Additionally it leads to megaloblastic anaemia, which is a foremost functional deficit in patients which is coupled with

neurologic disorder [26].

2. Notwithstanding either animals or humans, vitamin B deficiency exhibits impaired learning and the memory capabilities [27].

3. Though the literature offers numerous clues, but little scientific verification, that the aggressive behavioral syndrome can always be prevented and treated by handling nutritional factors. [28]

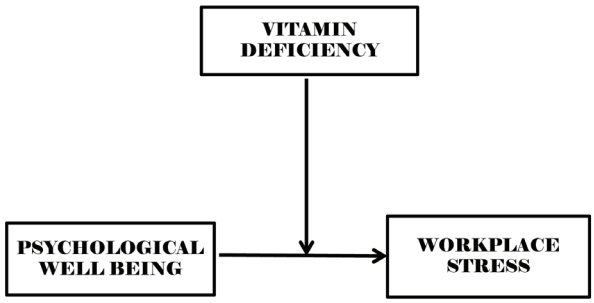
4. In spite of paucity of scientific evidence clues from case reports, open trials, observational (correlational) studies and animal studies suggest that attention to nutritional factors may reduce overaggressive behaviours and the consequent damages.

5. The deficiencies added to the safety of most nutritional interventions, forms a good platform for debate that a nutritional approach should be considered in the treatment of the aggressive behavioural syndrome.[29]

CONCEPTUAL MODEL

Based on the extensive literature and the resultant findings the conceptual model has been framed which is as follows:

The independent variable being the psychological well-being of the Indian militia, we are to find its influence on work stress and the behavioural consequences. Hence the variable "work stress" becomes the dependant



variable. As we would like to know the quantum with which the *vitamin intake* of an individual will strengthen his psychological wellbeing and subsequently fortify his ability to withstand work stress, this variable vitamin deficiency is labelled moderator of the model.

LIMITATIONS

The limitation of this study has been the availability of appropriate literature on the topic of study. The Indian Militia, being a highly conservative and prohibitive area for civilians, the scholarly literature available on this sector is too limited. Though there are several researchers done in this sector the access to such research material by the researchers had been very limited. Secondly, being a purely conceptual paper no scientific application finds place in this paper. It is only a preliminary secondary data analysis which is supposed to lead to an empirical study.

CONCLUSION

Giving due regard to the psychological needs of the armed forces was initiated the nodal agency with nomenclature Defence Institute of Psychological Research (DIPR). The primary purpose of this is to select personnel for armed forces, and provide technical assistance for ensuring person-job fit. It also pays attention to research on psychological aspects of its personnel. As we all know, all defence organisations are prone to discipline and protocols. As such, the outcome of research by third parties or individual researchers will be more liberal and the views of the militia hidden in their uniforms shall come out or it will be as if we pretend that Indian forces are disciplined and living a glorious life brushing under the carpet the humane side of our soldiers. To conclude, I choose the dialogue of Charlton Heston, in the movie *Ten Commandments* says " the strong make many bricks, the weak make little and dead make none" when there is an argument if we have to bother about those working for us.

Ethical Clearance: Not Applicable.

Source of Funding: Self

Conflict of Interest: NIL

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Cultural Approach for Maternal Mortality Reduction in Indonesia; Need of Unusual Business Intervention

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ABSTRACT

Contents: Maternal mortality becomes a complicated issue in Indonesia even in the world. Various programs and policies have been implemented, ranging from safe motherhood, maternal movement, making pregnancy safe, to the GOLD program. Nevertheless, the decline target has not been achieved. **Issue:** Indonesia, Maternal mortality is still high, 305 per 100,000 born alive. There are various points of concern which the factor of the cause of death from year to year is relatively fixed, the distribution of each province with coverage rate exceeds the target average. Visits on medical services were also high (average performance above 79%). It means that even if health services have been provided, there are basic factors that need to be explored about the difference in distribution results in each region. Also, the maternal mortality and infant mortality causing factors, almost always the same from time to time, while strengthening Government rules and policies have been increasing. We need to examine, that there are important things that we must control for community empowerment to be a solution for the reduction of MMR in Indonesia. **Lessons learned:** Indonesia is an archipelago, where each region has different local wisdom. To be able to reducematernal mortality and infant mortality in Indonesia, health workers must be able to manage the program in the right way. A cultural approach to bargaining power in efforts to achieve the reduction of maternal mortality and infant mortality in Indonesia.

Keywords: *Maternal mortality, Cultural approach, Business intervention*

INTRODUCTION

The success of maternal health efforts, of which can be seen from the indicator of Maternal Mortality Rate (MMR). This indicator is not only able to assess the maternal health program, moreover able to assess public health degree in general. Currently, the high maternal mortality rate (MMR), is a unique problem in some countries. Data WHO (2015), Maternal Mortality Rate in the world that is 289,000 in habitants. Every day there are 830 maternal deaths as a result of complications of pregnancy and childbirth. Of the 830, 550 occurred in Saharan Africa and 180 in South Asia, compared to 5 in developed countries.[1] In Indonesia, MMR was 305 per 100,000 live births.[2,3]

Various implementation of the program continuously strivesto decrease MMR. One of them is Safe Motherhood, with four pillars of family planning, antenatal care, clean and safe service and essential obstetric services. In addition to safe motherhood, Indonesia has also added other strategies as its supporters. Such as the launching of the mother affection movement, Making Pregnancy Safer (MPS), and the Expanding Maternal Neonatal And Survival program[4.] All of the above programs have been followed by strategic planning and other policies, such as the improvement of health personnel resources, education levels, facilities, facilities, partnerships, funding and maternal health care models.[5,6,7] Even though the program has been massively implemented in Indonesia, the target of achieving MMR reduction in Indonesia has not been evenly per province.[2] This needs to be examined more in-depth.

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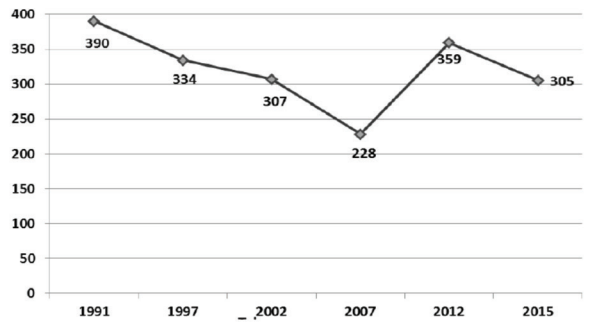
Differences in the characteristics, culture and local wisdom in each region, need to be responded by health workers in the provision of health services. Officers must have the knowledge and skills to manage individuals with cultural differences and collaborate with professional actors. Transcultural theory, in this case, becomes a collaborative strategy that supports the achievement of the goal of maternal safety efforts.[4,8]

ISSUE: MATERNAL MORTALITY RATE IN INDONESIA, A PERSPECTIVE

The success of maternal health efforts, among them, can be seen from various indicators of MMR, as shown in the table below:



Source: BPS-SDKI, 2016

Figure 1. MMR in Indonesia (1991-2015)

It appears that the targeted achievement of MMR decline in Indonesia has not been realized, target 2015 102 per 100,000, which reached MMR 305 per 100,000.

Table 1. The Causes of Maternal Mortality in Indonesia in 2010 to 2013

Causes of Maternal Mortality	Percentage in Each Year			
	2010	2011	2012	2013
Bleeding	1.46%	1.30%	1.25%	1.25%
Hypertension	0.88%	1.00%	1.09%	1.13%
Infection	0.21%	0.21%	0.21%	0.29%
Prolonged Labor	1.00%	0.04%	0.05%	0.00%
Abortion	0.17%	0.17%	0.05%	0.00%
Miscellaneous	1.33%	1.34%	1.42%	1.67%

Source: DG of Public Health, Ministry of Health, Republic of Indonesia, 2016

Factors that cause maternal mortality in Indonesia, relatively fixed, but the data describes the decrease in the percentage of causes is not much, just some of the causes have increased, including other factors other, that it can mean many things. Not only management, but it could be behavioral or environmental factors.

TRADITIONAL BELIEF ABOUT MATERNAL CARE

The period of pregnancy and delivering a baby is an important event that is strongly related to the beliefs and culture of society. Although women in Indonesia are highly committed to accessing maternal services, they also continuously practice traditional cultural practices such as diet during pregnancy, activity restrictions during the postpartum and parenting periods based on the culture of their parents[9].

The results of in-depth study through interviews and observations in the community against traditional beliefs, various aspects of maternal women under taken during the maternal period are still based on cultural values.

Positive motivation to follow traditional belief

During the period of pregnancy and childbirth, women trust certain foods passed down through generations as a good thing. One woman said "drinking soda causes contractions and danger to the fetus," another says "fish and meat make milk so fishy and make the baby lazy to drink." And they still follow the tradition.

Afraid if not follow the beliefs and traditions

Although many women in the period of pregnancy, childbirth, childbirth have visited health workers such as Posyandu, and have received information from midwives on health care, they still follow the existing tradition. For example about rituals, they say "feel comfortable if you have put a talisman (like a rock, scissors) on the baby." They are afraid that the night without the baby's charm will be fussy and get a negative aura. They believe that if they do not follow the traditional ritual, there must be something in themselves and the baby. Amulets are considered to have more benefit and feel secure.

Feel more comfortable with "Taraji" than a midwife

For them, the "paraji" is kind, patient and more experienced than the midwife. "Paraji" is still widely used outside of Java island, even they collaborate with

midwives in implementing a four-handed policy in the handling of childbirth. Some women say "feel safe and calm if they are assisted by a "paraji" with a midwife during her labor." For them, the "paraji" better understand the process and be patient, in communication or help the delivery. One woman said "I was assisted by a midwife at home during labor, but the "paraji" were here with me, and beforehand the paraji had massaged my stomach so that the baby would come down immediately." " "Paraji" also later that will care for and bathe my baby at the beginning of birth."

The natural birth impulse

Some mothers say that "paraji" are more patient waiting for babies to come than midwives. Often midwives do episiotomy for the baby to be born, and sometimes the midwife is impatient to take other actions when soon the baby is born. One mother said "I do not like the experience of giving birth at the clinic or hospital, so I trust the "paraji" in delivering a baby." I also do not want people to think anything negative during my labor if I give birth at the hospital.

Midwives are safer than "paraji" (use of medical standards)

Some women have used professional health services. One woman said "The paraji waited so long until my baby was born, it made me anxious about the unclear situation," He waited and did not wonder if I still had the energy or not. But a midwife gave me an intervention to strengthen my energy; they gave me infusion if I did not get into labor soon. One woman said, "my midwife member is injected if my labor is long, it gives me peace and feel safe for me." One woman said "paraji" pay less attention to sterile, sometimes they use strange and traditional tools, not even wear gloves."

In principle, trust and culture are still an important part of maternal services. The practice of paraji is still an option in society spread all over Indonesia. Women feel their culture, values, and beliefs in their way. Sometimes good, generally accessible and practiced in life. Beliefs about health during pregnancy are followed by traditional beliefs, and they are relatively suggestive. They are convinced that their destiny will be lived, and believes tradition is also part of prayer[10].

TRANSCULTURAL-CULTURE COMPETENCE, AN INITIATIVE- COLLABORATIVE

The framework of the nursing model is scientific and humanistic. It means that although medical development is more professional. We are still obliged to pay attention and make room for the existence of a culture that has been rooted in the community. Culture is the human mindset, a system of ideas, actions, and works in the life of society that belongs to man. Culture is the value of life, assets and lifestyle that is the very decisive view of life and health [11.12] Culture determines how the behavior of one's health, perspective and actions of individuals when having health problems. In line with the Transcultural theory of Leininger, that in providing nursing care to the client, the nurse must first have knowledge of the worldview of the dimension and culture and social structure. It influenced by seven factors, namely technology, religion and philosophy of life, social factors and kinship, lifestyle, politics, economy, and education.[8,13]

The implications of the transcultural theory, if studied in depth, align and strengthen the foundation of safe motherhood is the empowerment of women. Pregnancy and birth are important events that can not be separated from the beliefs and cultures that exist in the community, and each region has a different cultural characteristic. Women's empowerment is a key strategy that reinforces women's capacity to make decisions for themselves and their families. The importance of developing trust in relationships between officers and communities, beliefs and traditions, determines the policy and strategy of maternal-child health services through cultural modification and behavioral change.[14,15]

Leininger, in his theory, states the strategy is directed to the appreciation of cultural differences and transform such differences as the potential and strength in achieving the degree of health, through three things: 1). Culture care preservation, cultural retention, if not conflict with health, Planning is tailored to the relevant value that the client has. 2). Culture care accommodation, helping clients adapt to a culture that is more beneficial to health, 3). Culture care repatterning, if the culture possessed harm the client's health status.[8,16,17]

The strategy is not easy, to ensure that cultural modification can be an alternative solution for the strengthening of safe motherhood programs and policies,

the officer must have the ability to work effectively against cultural differences through awareness of detail, specific knowledge, skills, professional respect for cultural attributes18. A collaborative initiative between transcultural and cultural competence is a solution and strategy that will strengthen the safe motherhood implementing in reducing MMR.

Various characteristics of cultural competence that must be possessed by the officer are 1). Culture sensitivity (recognizing and valuing clients' perceptions, beliefs, values) Looking at clients with the understanding that they have a pattern of life, habits, self-defense mechanisms of the problem, as well as cultural behavior. The officer should able through a process of study and good communication, habits, variations in life, attitudes and ways of managing their health problems. Health workers should not under estimate the client regarding the value held about health issues), 2). Culture knowledge (The importance of health workers equip themselves with anthropology-related knowledge, how humans differ in character, the value of life, habits, patterns of relationships, health system support and health behaviors in the community). Officers must understand how patients perceive and address health problems the cultural base it embraces), 3). Cultural empathy (cultural awareness, in managing modification of care interventions) Officers should be able to develop emotional control, feel care and empathy for clients' health problems Feeling emotional involvement in managing client issues in the community) 4).Culturally relevant relations (considering the background culture in establishing client-care professional relationships. The officers are required to minimize disease complications caused by the influence of cultural values, deepening the client culture as a benchmark of their health processes and programs, as well as making the client culture a part of the intervention care planning and management) 5). Culturally appropriate health care delivery (the ability of health workers in the cultural selection, primarily the adoption of alternative medicine based on a deeply rooted community belief, but not contrary to medical, it is essential to avoid treatment conflicts and make appropriate treatment cultures as treatments), 6). Cultural guide (Health worker should be able to guide solution when cultural factors become part of health problem. Sometimes we need to breakdown the positive or negative truth of healthy sick culture Officer must have the potential of insight in studying and deciding the cultural issue, and propose relevant thinking including changes in the mindset of the community).[19,20,21]

Developing a trusting relationship between officers and the public is vital. Traditional beliefs should be discussed together among health workers, policymakers and program planners in enhancing their understanding of how to develop strategies for improving midwifery services. Maternal knowledge of pregnancy complications is a priority for women, but it makes them aware of a danger signal as a strategy to avoid complications is the main thing. In Indonesia, maternal mortality decline is not enough to implement government programs and policies. However, health personnel should be able to manage the program by understanding and conducting specific approaches in each region in Indonesia. Cultural approach and knowledge of cultural competence can be a promising opportunity in achieving the reduction of MMR in Indonesia

LESSONS LEARNED

It was concluded that to be able to reduce the maternal mortality and infant mortality in Indonesia; it is not enough to implement various programs and policies that have been determined by the government. However, health workers must be able to manage the program in the right way. By the paradigm of nursing maternities "Family-centered," then the educational approach to bargaining power to achieve the reduction of the maternal mortality and infant mortality in Indonesia.

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Micro Hardness of Demineralized Enamel Following Different Surface Treatment Protocols

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ABSTRACT

Aim: The aim of the study was to evaluate microhardness of demineralized enamel following different surface treatment.

Materials and method: 114 extracted intact posterior teeth were selected so to obtain 228 samples. They were sectioned mesio-distally and coated with nail varnish so to obtain windows of 3mm × 3mm. All except control were demineralized by placing in demineralizing solution for 24 hours. The samples were divided into 19 groups of six samples each as follows :1. Control, 2. Demineralized teeth, 3. Laser 2 watts, 4. Laser 2.5 Watts, 5. Laser 3 watts, 6. Laser 3.5 watts, 7. Laser 4 Watts, 8. Enafix, 9.CPP-ACP F, 10. Laser 2 watts + Enafix, 11. Laser 2.5 Watts + Enafix, 12. Laser 3 watts + Enafix, 13 Laser 3.5 watts + Enafix , 14. Laser 4 watts + Enafix, 15. Laser 2 watts + CPP-ACP F, 16. Laser 2.5 Watts + CPP -ACP F, 17. Laser 3 watts + CPP-ACP F, 18. Laser 3.5 watts + CPP-ACP F, 19 Laser 4 watts + CPP-ACP F.

Statistical analysis was done by non-parametric test Kruskal Walis and Mann Whitney and one-way ANOVA test and Post Hoc test for multiple comparison.

Results: The mean hardness value of controls was 262.87. The demineralized group had the least hardness value (101.50). The hardness values of Laser 3.5 watts followed by application of CPP-ACP F paste was the closet to that of control (245.15). The laser 4 watts and CPP-ACP F combination was next best (244.50). The irradiation of 3.5 watts (235.83) and 4.5 watts (235.87) was just marginally less than the same wattage followed by CPP-ACP F group.

Conclusions: Aluminium Gallium Arsenide Laser when used in combination with CPP-ACP F brings about statistically significant increase in surface hardness and results are comparable to lasers when used alone. The scores are similar to control tooth.

Keywords: *Aluminium Gallium Arsenide Laser, surface hardness, surface treatment*

INTRODUCTION

Dental caries is the most commonly occurring oral condition with a multifactorial etiopathogenesis and arises from an imbalance in the ongoing episodic phases of remineralization/ demineralization of the tooth. The imbalance arises from the microbiological shift within the complex biofilm. Dental caries is a disease continuum and its initiation and progression are affected by consumption of refined carbohydrates, patients salivary flow and clearance rate of saliva and also inclusion of any preventive routine that the patient has embraced. [1, 2]

At a normal pH, an equilibrium is maintained as the ionic activity product of hydroxyapaptite is equal to

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solubility constant of hydroxyapaptite. Hence there is no dissolution of the enamel. The dental biofilm houses acidogenic bacteria and in presence of sucrose and its metabolism the pH plunges from resting to critical pH. Thus, due to prolonged and increased acidic challenges of the biofilm the ionic activity product of hydoxyapaptie becomes lesser than the solubility constant of hydroxyapaptite, and thus the demineralization process is initiated. The fall of the pH at the plaque-tooth interface will result in dissolution of tooth structure over a period of time and eventually tooth demineralization will occur. The end result of this episodic events was a conversion of the natural physiological process to a pathological entity that is initiation of incipient carious lesion. [3,4]

The hallmark of such incipient lesion is its location and likelihood of reversibility. The lesion is initially subsurface and if an remineralizing protocol is added then seesaw effect of demineralization remineralization phase can be tipped and maintained in remineralization zone. [1-4] Fluoride and non-fluoride anticariogens have been included to favour remineralization. The role of lasers in harnessing the remineralizing potentiality of the tooth has been addressed since few decades. [5]

The effectiveness of various surface treatments can be evaluated by surface hardness testing. Enamel surface micro hardness refers to a tooth's resistance to scratching, abrasion, and indentation. The physical-mechanical effects of Nd:YAG laser irradiation on sound enamel has been reported to increase surface micro hardness by fusion of enamel surface. [6,7] An even more protective effect of enhancing the resistance of sound enamel to an in vitro cariogenic challenge has been shown when topical fluoride agents have been added to the protocol. Wavelengths of Al Ga As laser diodes have a greater selectivity in targeting and removal of the carbonate group from the enamel mineral molecule results in a greatly increased acid resistant enamel. Additionally, the altered mineral has greater uptake of topically applied fluoride and thus greater acid resistance. [8,9]

MATERIALS AND METHOD

1. Laser fluorescence device (DIAGNOdent pen 2190 KaVo, Biberach, Germany)

2. Aluminium Gallium Arsenide Laser (WhitestarTM, Creation, Verona, Italy)

3. Casein Phosphopeptide-Amorphous Calcium Phosphate Fluoride (CPP-ACPF) paste

4. Calcium sucrose phosphate (ENAFIX) paste

5. Demineralizing Solution (acetate 0.1 Mol/L, calcium 0.1 Mol/L, phosphate 0.1 Mol/L, fluoride 0.1 mg/L pH 5.0)

6. Micro Vickers Hardness tester (Matsuzawa Co., Ltd, Toshima, Japan).

114 extracted intact posterior teeth were selected so to obtain 228 samples. They were sectioned mesio - distally and coated with nail varnish so to obtain windows of 3mm × 3mm.The samples were divided so each group had 6 samples each.

1. C=Control
2. Demin=Demineralized teeth
3. L2=Laser 2 watts
4. L2.5= Laser 2.5 Watts
5. L3=Laser 3 watts
6. L3.5= Laser 3.5 watts
7. L4= Laser4 Watts
8. Ena=Enafix
9. CA=CPP-ACP F
10. L2 Ena=Laser 2 watts + Enafix
11. L2.5 Ena= Laser 2.5 Watts +Enafix
12. L3 Ena=Laser 3 watts + Enafix
13. L3.5 Ena = Laser 3.5 watts + Enafix
14. L4 Ena = Laser 4 watts + Enafix
15. L2 CA=Laser 2 watts + CPP-ACP F
16. L2.5 CA=Laser 2.5Watts+ CPP -ACP F
17. L3 CA=Laser 3 watts + CPP- ACP F
18. L3.5 CA=Laser 3.5 watts + CPP- ACP F
19. L4 CA=Laser 4 watts + CPP-Acp F

The control group had no treatment done on it. All groups except control group were demineralized by

demineralizing solution (acetate 0.1 Mol/L, calcium 0.1 Mol/L, phosphate 0.1 Mol/L, fluoride 0.1 mg/L pH 5.0) for 24 hours.

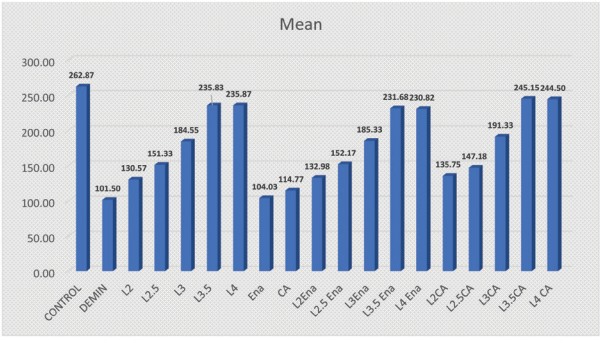
The groups which had laser treatment were irradiated with respective wattage for 30 secs. The groups which had only the remineralizing paste application, it was done for one hour. The groups which had laser and remineralizing paste were irradiated with the respective wattage for 30 secs and then paste was applied for one hour. Thereafter all groups were tested for micro surface hardness Micro Vickers Hardness tester (Matsuzawa Co., Ltd, Toshima, Japan) and the values noted and data collected, studied, tabulated and analysed.

RESULTS

Statistical analysis was done by non-parametric test Kruskal Walis and MannWhitney and one-way ANOVA test, Post Hoc test for multiple comparison.

GRAPH 1: The mean hardness of all groups was compared. The mean hardness value of controls was 262.87. The demineralized group had the least hardness value (mean hardness value 101.50). The hardness values of Laser 3.5 watts followed by application of CPP ACP F paste was the closet to that of control (245.15). The laser 4 watts and CPP ACP F combination was next best (244.50). The laser irradiation of 3.5 watts (235.83) and 4.5 watts (235.87) was just marginally less than the same wattage followed by CPPACP F group. The group of Enafix had values closer to demineralization group (104.03). The values of laser followed by paste were higher than when paste was used alone. The results were statistically significant.

TABLE 1: All the groups have highly significant difference with control but two groups L3.5CA and L4CA have mean values near to control. Though significant difference is there with control.



Graph 1: Mean Vicker's Hardness values of all groups

Table 1: Comparison of groups with control

	Mann-Whitney U	Z	p-value
DEMIN	0	-2.88	0.004
L2	0	-2.89	0.004
L2.5	0	-2.89	0.004
L3	0	-2.89	0.004
L3.5	1	-2.73	0.006
L4	1	-2.73	0.006
Ena	0	-2.88	0.004
CA	0	-2.88	0.004
L2Ena	0	-2.88	0.004
L2.5 Ena	0	-2.88	0.004
L3Ena	0	-2.88	0.004
L3.5 Ena	0	-2.88	0.004
L4 Ena	0	-2.88	0.004
L2CA	0	-2.88	0.004
L2.5CA	0	-2.88	0.004
L3CA	0	-2.88	0.004
L3.5CA	5	-2.09	0.037
L4 CA	5	-2.09	0.037

DISCUSSION

Hardness is a measure of the resistance to localised plastic deformation induced by either mechanical indentation or abrasion. It is a physical condition of the tooth which will reflect the extent of a tooth mineralization. It is derived and depends on the tooth internal crystalline arrangement of enamel prisms and lattice arrangement which in turn reflect the mineral content. A carious tooth or a demineralizing lesion will reduce the micro hardness of the tooth and hence it follows as a corollary that when a tooth is subjected to remineralizing protocols which increase its acid resistance there would be increase in microhardness. [10,11] Enamel mineral loss or uptake is correlated to the changes in surface microhardness. Hence, in the present study, microhardness test has been used to assess different surface treatment protocols.

Fluorides have been used for over decades to bring about remineralization varying degree of success. The greatest challenge with fluoride is the availability of calcium and phosphate ions Thus casein phosphopeptide

with amorphous calcium phosphate has been introduced to keep calcium and phosphate in metastable state. [12] Further repeated application of the remineralizing paste is needed to bring about desired results. [13] Hence an alternative modality which could overcome the challenges of these paste-based protocols was researched.

Sognnaes and Stern in 1966 observed that Nd:YAG laser irradiation brings about increased acid resistance and suggested it be used for caries inhibition. [14] Hicks, et al. in an invitro study in 1993 observed that argon laser can be used for caries prevention. [15] High powered lasers have also been reviewed for caries prevention. Featherstone et al concluded-on basis of invitro studies that CO_2 lasers has an caries inhibitory potential. [16] However, Yamando and Sato did not find any discernible difference between laser and non-laser irradiated surfaces. [17] Most of the studies have been with high power laser and with low power lasers there has been sporadic evidence-based reports. [18] In this study aluminium gallium arsenide laser was used. The surface treatment protocols which were evaluated were different wattages of 810 nm of aluminium gallium arsenide laser alone or in combination with the pastes like CPP-ACP F and calcium sucrose phosphate paste.

The laser irradiation of 3.5 watts increased the hardness of demineralized sample of 101.50 hardness to 245.15. These results were replicated by laser 4 watts and CPP ACPF combination at Vickers hardness nos 244.50. The lasers group of 3.5 and 4 watts had a score of 235.832 and 235.87 respectively. The remineralizing pastes when used alone had hardness values closer to that of demineralized samples. The combination of laser and paste had more or less similar values to that of the respective laser wattage when used alone. The result of this study that laser followed by remineralizing paste bring about an increase in surface hardness was in confirmation to the result of other studies (Graph 1, Table 1). [14-18] The previous studies [14-19] have used laser followed by remineralizing paste and this sequence brought out the best results and these values were closer to that of control.

The mechanism of action of the laser has not been elaborated and elucidated but it has been hypothesized that laser brings about a change in the hydroxyapatite crystal alignment and this change of lattice arrangement brings about increased acid resistance. [9,20]

CONCLUSION

1. Laser when used in combination with CPP-ACP F brings about statistically significant increase in surface hardness and the results are comparable to lasers when used alone. The scores are similar to control tooth.

2. Remineralizing paste when used alone do not bring about increase in surface hardness.

Ethical Clearance: Taken from A. B. Shetty Memorial Institute of Dental Sciences Ethics Committee

Source of Funding: Self

Conflict of Interest: Nil

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Rare Case of Simple Bone Cyst of Talus in an Adult: A Case Report

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ABSTRACT

A case of simple bone cyst of talus is reported because of its rare occurrence in an adult. The patient presented to us with antalgic gait and long standing intermittent severe pain in right ankle region. According to clinical, radiological and histopathological examination, it was diagnosed as a case of simple bone cyst. Out of available modes of treatment curettage and compression bone grafting with allograft was preferred considering the size and location of cyst in talus. Three year follow up showed complete consolidation of bone graft and pain free ambulation.

Keyword: *Allograft; Bone bank graft; Simple Bone Cyst; Talus.*

INTRODUCTION

We are reporting this case of simple bone cyst of talus in an adult in order to emphasize the need to be vigilant enough so as not to undermine the possibilities of rarest of situation that we may encounter in our practice. Simple bone cyst is a rare tumor of bone accounting only 3% of all bone tumors [1]. It is more common during childhood and much rarer in adulthood [1, 2, and 3]. Most commonly, it involves the long bone metaphysis and rarely the small bones [4].

CASE REPORT

A 43 year old male patient presented to us with chief complaints of insidious onset, intermittent severe pain in right ankle, limping and difficulty in walking for past 6 years. There was no history of any swelling, fever, night sweats, trauma or similar complaints in other joints of body.

General examination was within normal limits. On local examination, tenderness was present over the ankle joint line and over medial aspect of talus and with minimal ankle joint movement's restriction. There was no visible or palpable swelling, local temperature was normal and there was no distal neurovascular deficit.

Patient was subjected to multiple investigations like x-ray, MRI and CT-scan of the right ankle region. X-ray showed an osteolytic lesion in body of talus on the medial side (figure 1a and 1b). MRI revealed a well defined intra-osseous large area measuring 2.6cm in anterior-posterior dimension, 1.6cm cranio-caudally and 1cm in transverse dimension. Lesion had altered signal intensity and was present on the medial aspect of the talus with significant surrounding oedema and overlying cortical disruption (figure 2a and 2b). CT scan findings were suggestive of two cystic luencies in the body of talus separated by thin intervening septa and extending up to the cortical margins with irregular joint margins (figure 3). Routine laboratory investigation, differential and total leukocyte count, ESR (erythrocyte sedimentation rate) and QCRP (quantitative C- reactive protein) were absolutely normal.

Patient was taken up for curettage and compression bone grafting. Talus was approached anteromedially and bone cavity was opened through the small fenestration in the medial wall of talus as seen under the c-arm images. The intervening septa between two large adjoining cystic cavities were broken down under c-arm intensifier

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into a single cavity (figure 4a and 4b). Bloody fluid was evacuated and sent for culture sensitivity, ZN staining and tubercular culture. Lining membrane was curetted and was sent for histopathology. In order to create a vascular bed for osteointegration of allograft mastoid bone burr was used to curette the cavity and was drilled at multiple sites in the talar neck. Impaction bone grafting of the harvested allograft from our standardised bone bank was done after its thorough preparation with ethylene oxide and normal saline to defat and to diminish its antigenisity [5].

Histopathological examination showed multiple cholesterol and foam cell suggestive of simple bone cyst.

In the post op rehabilitation ankle was immobilised for 6 weeks in below knee pop slab followed by walking below knee cast for another 6 weeks. At 12 weeks post op, the x-ray of the right ankle showed fully consolidated impacted bone graft and patient was doing full weight bearing without any limping and pain.

The patient was followed up regularly every 3 months. Three years follow up x-ray (figure 5)and CT-scan revealed well consolidated bone graft with intact joint space and homogenous joint margins with full range of motion and pain free ambulation (figure 6a and 6b).

Figure 1: Pre operative AP and lateral radiograph showing osteolytic lesion in body of talus.

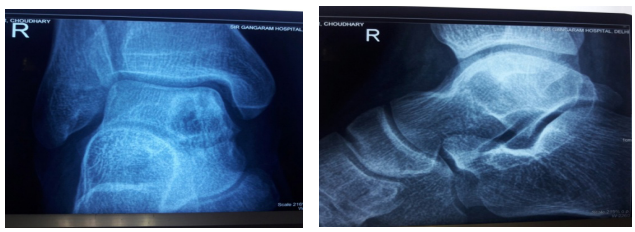
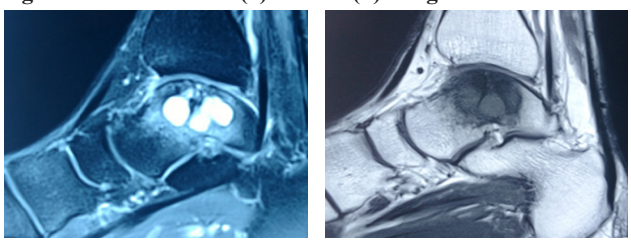


Figure 1.

Figure 2: MRI with T2 (a) and T1 (b) images.



(2a) **(2b)**

Figure 3: Pre operative CT scan showing 2 osteolytic cavities separated by thin septa.

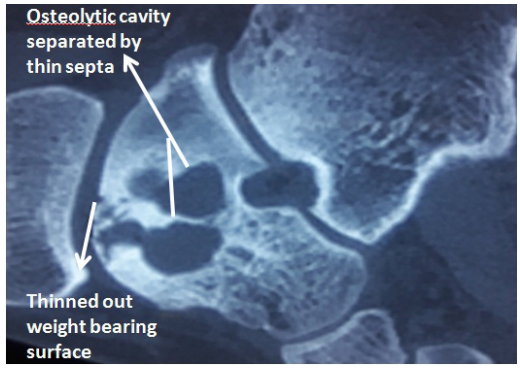
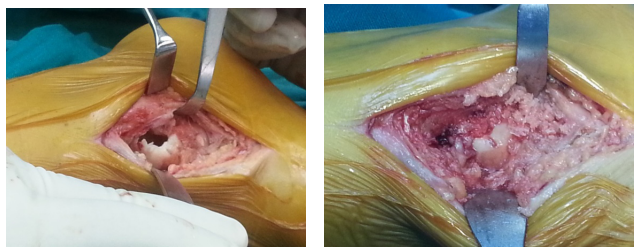


Figure 3

Figure 4: Intra operative photograph showing large bone cavity before (a) and after (b) impaction bone grafting.



(4a) **(4b)**

Figure 5: 3 years follow up x-rays showing well consolidated bone graft with intact joint space and homogenous joint margins.

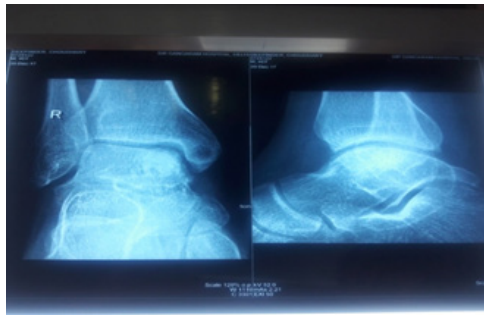
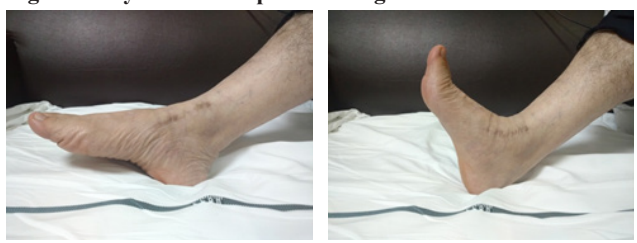


Figure 6: 3 year follow up ankle range of movement



(6a) **(6b)**

DISCUSSION

The clinical profile of patient, site of lesion and outcome of various investigations helped in diagnosing this rare cystic lesion as a case of a simple bone cyst. Typically, simple bone cyst is a benign osteolytic tumor of bone which is more common in children than in adults

[1, 2, and 3]. It usually involves the long bone metaphysis [4]. The usual picture on xray is a uniloculated osteolytic lesion with cortical thinning, pathological fracture may be present, fallen fragment sign is pathognomic [6]. MRI shows hypointense lesion on T1 and hyperintense lesion on T2 images [6]. Histopathologically, it is lined by flat plump epithelial cells along with few giant cells, cholesterol cells and fat cells [7]. Our case with its many atypical features like late age of onset, unusal site of presentation in talus located eccentrically, multiple cystic lesions with sclerosed margins containing homogenous fluid, posed a diagnostic dilemma.

Aneurysmal Bone Cyst, Giant Cell Tumor, Avascular Necrosis and Tuberculosis of Talus were the other possibilities which required to be excluded by clinicoradiological, lab work up and histopathological examinations. Aneurysmal Bone Cyst is a vascular malformation which presents with multiple cystic lesions located eccentrically in the metaphysis of long bones and MRI typically shows presence of pathognomic multiple fluid- fluid levels [8, 9, 10, 11 and 12]. Giant Cell Tumors presents in between 20 to 40 years of age with prelidiction for epiphysis of long bones, soft tissue swelling is typically out of proportion with the bony lesion and radiologically it present as a soap bubble appearance [13]. AVN of Talus is a common condition due precarious blood supply of this bone. It present as long standing pain in young active athletes, radiologically it presents as varying degree of collapse and leads to secondary osteoarthrosis of the ankle joint [14]. Tuberculosis of talus is usually a squeal of pulmonary tuberculosis in the past. There is early disruption of the joint space due its prelidiction for synovium. The bony lesion presents as marginal sclerosis, fluid in the cystic cavity and central erosion in MRI [15, 16 and 17].

The primary objective of treatment of simple bone cyst is to provide functional bone which can bear loading stresses. There are no established guidelines in the management of a simple bone cyst. However, treatment as reported by different authors depends upon the patient's age, site and size of lesion. Treatment given for simple bone cyst in children, non weight bearing bones and for small cyst is usually conservative [18, 19].

Various surgical and non surgical modalities of treatments are available in the management of simple bone cyst. Non surgical treatment includes injection of methylprednisolone acetate alone or along with bone marrow or demineralised bone matrix and injection of calcium sulphate bone cement. Surgical treatment involves curettage with bone grafting or bone graft susbstitutes like calcium sulphate or calcium phosphate pellets, cyst excision, flexible intramedullary nailing for long bone cysts and continuous decompression with cannulated screws for small bone cysts[20].

In our case since the cyst involved major portion of the dome of talus with breach in the articular surface therefore curettage and impaction bone grafting was done. This was preferred over other modalities of management as the cyst was of very large volume and encroaching into the the articular surface. Compression bone grafting of this cyst created a solid construct which was mandatory to achieve in this case in order to prevent it from collapse. Considering the massive size of the cyst, harvested allogenic graft from our standardized bone bank was preferred to avoid the donor site post operative morbidity. However, this mode of management lead to stiffness of the involved ankle joint along increased osteoporosis of the involved bones as ankle required prolonged immobilization in cast. Newer minimal invasive modes of management of cyst like injection of calcium sulphate bone cement allows early weight bearing and spares from complications of prolonged immobilization associated with curettage and bone grafting.

CONCLUSION

Simple bone cyst of small bone is a rare bone tumor in adults. It is a diagnostic dilemma which needs to be sorted out with comprehensive investigations and systematic exclusion of the more common possibilities. The treatment modality is determined by the size and location of the cyst. Nowadays, minimal invasive modes of management like injection of methylprednisolone acetate and calcium sulphate bone cement are preferred due to early rehabilitation of patients. Access to the standardized bone bank is mandatory in management of very large cysts requiring curettage and allogenic bone grafting.

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Ethical Clearance: Ethical committee Sir Ganga Ram Hospital New Delhi.

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Radiation Induced AVN of Hip Joint Following Pelvic Irradiation for Endometrial Carcinoma

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ABSTRACT

Introduction: AVN of the femoral head is a grave complication following pelvic irradiation. This case report provides an insight into diagnosis and management of this underestimated but important clinical problem .Due to its precarious blood supply, femoral head is one of the most common sites to undergo osteonecrosis following irradiation. A dose of 50 Gy has been accepted by various authors as threshold for development of radiotherapy induced AVN of femoral head.

Case: This is a case report of a 72 years old housewife who presented with localised pain in the right hip and groin for the last 2 months with no history of previous trauma or osteoarthritis right hip .On examination of right hip, patient had painful range of motion with 2cm of true shortening and 10 degree of fixed flexion deformity .In past Two years back, she was diagnosed as a case of adenocarcinoma of endometrium. She was treated by three cycles of chemotherapy followed by Abdominal Hysterectomy with Bilateral Salpingo-Opherectomy.Post operative she received adjuvant external beam radiotherapy and three sessions of intravaginal high dose rate (HDR)brachytherapy. She remained alright for two years following radiotherapy course .She presented to us with pain and limping right hip for last two months. Patient was subjected to detailed investigations like MRI, CT scan, Roentgenographic Evaluation and CT Guided Biopsy and was diagnosed as case of post irradiation AVN of right hip (STAGE IV). After having excluded the presence of metastases in the right hip, patient was taken up for cemented Total Hip Replacement with bone grafting of the medial deficient acetabular wall. Patient was discharged on 7th post OP day with full restoration of limb length and painless fully mobile hip without limping.

Conclusion: Post irradiation AVN of the hip joint remains a diagnostic dilemma for the clinicians and if not managed timely and adequately it leads to severe morbidity in the patients .A high index of suspicion and cautious exclusion of progression of skeletal metastases is the key in timely diagnosis of this otherwise rare but grave long term complication following pelvic irradiation.

Keywords: *Avascular Necrosis (AVN), Pelvic irradiation, Endometrial carcinoma, Bony Metastases*

INTRODUCTION

This case report documents post irradiation AVN right hip joint following the thereuptic pelvic irradiation for adenocarcinoma of endometrium .It is aimed in providing a valuable insight to clinician worldwide in the diagnosis and management of this underestimated grave complication. Pelvic radiotherapy continues to be an indispensible component in the treatment modalities of carcinoma of various pelvic organs namely endometrium, cervix, urethra, ureter and gonads .Inspite of revolutionary advancement in pelvic radiotherapy delivery protocols, AVN or Radiation Injury of hip [(1)] and its consequences continues to be the most severe and challenging long term complication.

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The term irradiation injury of hip coined by Duparc et al[1] and post irradiation osteoarthritis by Meary et al [2] signifies the hazardous outcome of pelvic irradiation on hip joint i.e. AVN. There are at least two postulated factors responsible for radiation induced AVN. Firstly, cellular component depletion caused by direct radiation insult [3].Secondly ,the local ischemia resulting from radiotherapy-induced micro vascular damage ranging from thickening of walls of blood vessels to their complete obliteration as reported by Mac daugall et al [4] and by Ewing J[5]. AVN most commonly affects the bones located distant from vascular territories especially those which have single terminal blood supply and limited collateral circulation such as femoral head, femoral condyle, head of humerus, capitulum and proximal part of the scaphoid and talus. [6, 7]

The critical dose above which osteonecrosis may occur ranges from 3000-4000 rads (30-40Gy).Apart from radiotherapy dose and irradiation volume , bone structure ,its location and patients age are relevant in determining the extent of damage .[8,9]

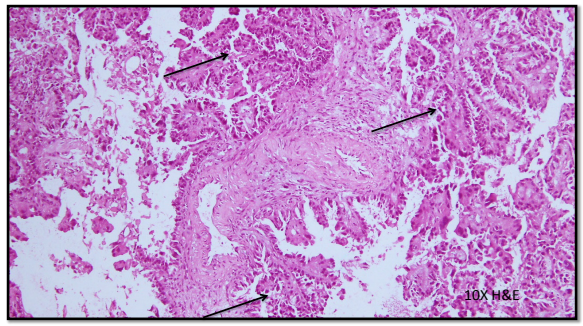
The treatment modality is determined by the stage of hip destruction at which patient presents. In most of the cases it is surgical which may range from core decompression in early stages to hip arthroplasty in advanced stages.

CASE

72 years old female, presented with pain in the right hip and limping for the last 2 months. She was apparently alright 2 months back when she started experiencing excruciating localised pain in the right hip .Pain got aggravated with movements and weight bearing and relieved by rest and analgesics. One month following pain patient started limping for which she required single stick for ambulation. She was systemically preserved with no history of trauma or osteoarthritis in the right hip.

Examination of the right hip revealed tenderness over the anterior joint line, painful range of motion, fixed flexion deformity of 10 degree, supra-trochantric true shortening of 2 cm and no other fixed deformities were present.

She has past history of frequency of micturation with burning sensation two years back for which she took gynaecology consult. On evaluation, she was diagnosed as a case of well differentiated adenocarcinoma endometrium (stage IV) (figure 1) and chronic nonspecific cervicitis. MRI revealed distended endometrial cavity with minimal residual tumour and no evidence of myometrium invasion.



ADENOCARCINOMA ENDOMETRIUM SHOWING PROMINENT PAPILLARY PATTERN (↗)

Figure 1: section of endometrium shows adenocarcinoma, having prominent papillary pattern .the papillae are lined by non mucinous, short columnar epithelium showing moderate nuclear pleomorphism

Patient was subjected to three cycles of chemotherapy. This was followed by total abdominal hysterectomy with bilateral salpingo-opherectomy with pelvic lymph node dissection with retroperitoneal lymph node sampling with total omentectomy under GA and sample was send for histopathology.

Histopathology report showed no viable tumour in right and left pelvic and retroperitoneal lymph nodes. Both parametria and omentum were also free of metastases. According to TNM staging tumour was staged as pT1N0MX.

Two months post operative X-ray Chest, CECT Abdomen and CA 125 were found to be within normal limits and she received adjuvant external beam radiotherapy using image guided external beam radiotherapy technique and three session of intravaginal high- dose- rate(HDR) brachytherapy (IVRT) for three consecutive weeks with dose of 7 Gy given at 1mm mucosa.

Following the radiotherapy course patient remained alright for next 2 years. She presented us two months back with history of severe localised pain and limping in the right hip. She was subjected to thorough physical examination and detailed investigations like Roentgenographic Evaluation (figure 2), MRI (figure 3), CT scan and CT Guided biopsy. After exclusion of metastases and with CA 125 within normal limits, she

was diagnosed as case of post irradiation AVN right hip. According to international classification of femoral head osteonecrosis (association research circulation osseous [ARCO]) and Ficat's classification, our patient was classified as AVN stage IV.

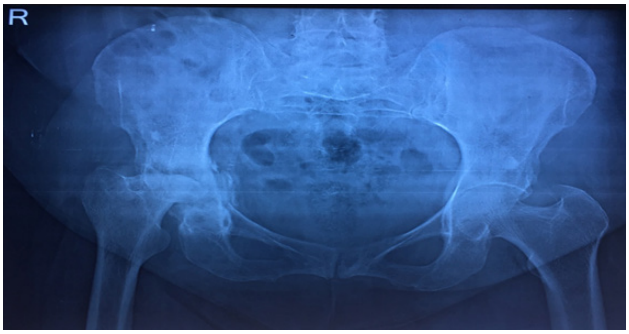


Figure 2: X ray pelvis with both AP: Osteolysis of femoral head and the acetabulum, Insufficiency fracture medial wall acetabulum with callus formation, avascular necrosis of femoral head- Flattening, sclerosis, deformity

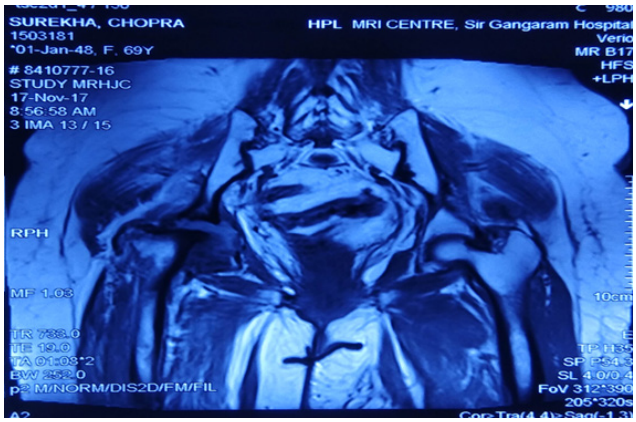


Figure 3: Complete resorption of the femoral head of the right side including the head and neck regions with fluid collection within the joint space and along the iliacus muscle and edema in the gluteal muscles. These findings are possibly post traumatic AVN.

Depending on patients age, her clinical status and AVN staging of the right hip she was taken up for cemented total hip replacement along with autobone grafting of deficient medial acetabular wall (figure 4). The capsule and part of deformed femoral head were send for histopathological evaluation which revealed radiation induced AVN changes and negated the presence of any granulomatous and neoplatic lesion (figure 5 & 6).

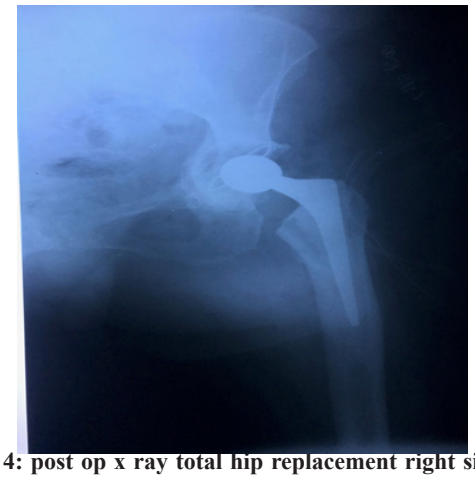


Figure 4: post op x ray total hip replacement right side with bone grafting over deficient medial wall acetabulum

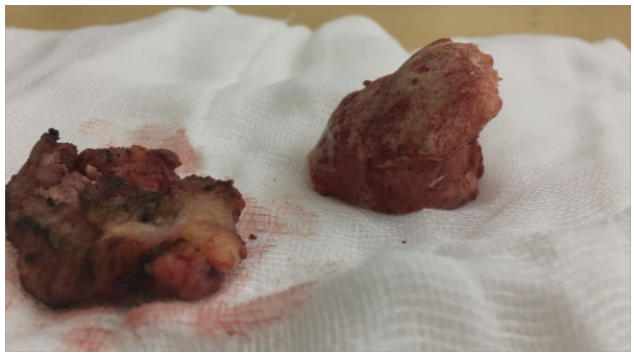


Figure 5: per operative specimen deformed head and capsule send for histopathology

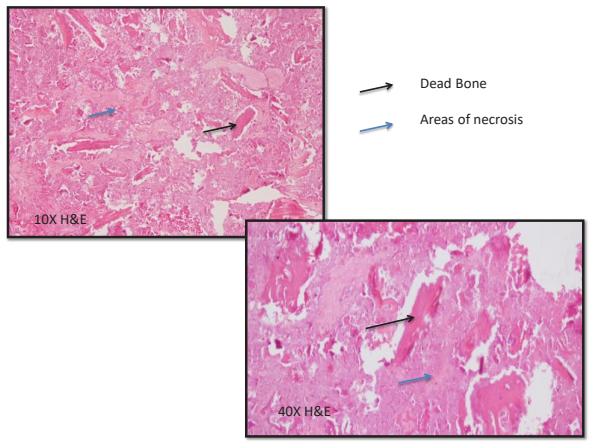


Figure 6: histopathology report of capsule of right hip joint and head of femur shows radiation induced AVN.

Patient was discharged on 7th post OP day with full restoration of limb length and painless fully mobile hip without limping.

DISCUSSION

Post irradiation AVN of hip joint is a late complication of previously irradiated pelvis. This is apparent from our case and by Hall FM et al [10] study was patients

developed AVN after 2 and 5 years respectively following pelvic irradiation. The long average latent period in the development of this complication emphasises the role of multiple etiological factors interplay however once they appear the disability progresses rapidly within a short span of time. In our patient, who was apparently alright 2 month back started experiencing excruciating pain in the right hip followed by gross limping.

Our patient received three cycles of cytotoxic chemotherapy pre operatively and post operative adjuvant external beam radiotherapy followed by 3 session of intravaginal HDR brachytherapy (IVRT) in the total dose of 50-54 Gy. As reported by Bragga et al [11] 50 Gy is the threshold dose to induce osseous necrosis. As postulated by various studies radiotherapy interferes with nutrition of the bone due to obliteration of vascular supply .This is supported by the fact that irradiation dose as low as 2500 rads initiates changes in the endothelium of the local blood vessels [12].Compromised circulation may lead to direct destruction of osteoblasts and impair their regeneration .The fine balance between bone formation and resorption is lost leading to deficient remineralisation, weakening and ultimately its collapse which are pathognomic of AVN changes. [13]

The radiation tolerance of the femoral head and neck is substantially lower than the long bones. According to the currently accepted normal structure tolerance guidelines, there is 5% risk of AVN if entire femoral head received 52 Gy which rises to risk of 50% after a dose of 65 Gy. With the modern times refined RT techniques and infrastructure , it is possible to minimise the post irradiation osseous damage of hip joint by delivering high doses to a limited volume with use of small irradiation field and protective shields which blocks the femoral neck and most of head. In situations where inguinal lymphnodes need irradiation, the femoral head and neck are invariably exposed to radiation dose above the threshold leading to osteonecrosis. [14]

In our case and in studies by different authors RT is not the only incremental causative factor to develop AVN of hip joint due to presence of other risk factors like concomitant administration of systemic cytotoxic chemotherapy ,Bisphosphonates, Bone Modifying Agents and long term androgen therapy .[15]

It is difficult to explain why our patient developed unilateral AVN of the right hip inspite of the fact that the left hip too received identical irradiation doses. As stated by different authors there may be a few contributory factors leading to progression of AVN changes in the hip joint. Firstly, Irradiation injury to the femoral head is severe in presence of involved inguinal lymph nodes requiring simultaneous irradiation. Secondly, there could be inadequate shielding of the involved hip as compared to opposite side. Last but not the least , it could be traumatic due to varying forces on one side owing to protective distribution of stresses due to altered biomechanics. This unilaterally increased stress is enough to cause collapse and fracture of the already vascular compromised bone [16].Weight bearing causes repetitive traumatic insult exacerbating and evolving picture of AVN.It is, therefore, pertinent on part of treating clinician to be aware of all the contributing factors leading to AVN of the hip joint in order to prevent progressive disability to the patient.

Depending on our patient's age, her severity of pain, limping and the extent of right hip destruction she was taken up for right hip cemented total hip replacement with autologus bone grafting of deficient medial acetabular wall. The surgical treatment remains the corner stone in management of AVN hip joint and preoperative staging determine the type of surgery. Core Decompression, Cortical Bone Grafting and Allograft procedure are advised in management of early stages .Whereas, Arthrodesis and Excision or Replacement Arthroplasty advised in management of late stages of AVN of the hip joint

High rate of acetabular failure has been reported by different authors in post irradiated THR.This has been explained by the increased mechanical insuffiency of the irradiated peri acetabular bone. Various authors have recommended metal re -enforcement rings to enhance the stability of acetabular component by improving the transmission of weight- bearing stress

from prosthesis to the bone .However, in our case we did not consider using of the metal re- enforcement ring because of relatively well preserved peri- acetabular bone.

CONCLUSION

Post irradiation AVN of the hip joint remains the diagnostic dilemma for the clinicians and if not managed timely and adequately it leads to severe morbidity in the patients .A high index of suspicion and cautious

exclusion of progression of skeletal metastases is the key in timely diagnosis of this otherwise rare but grave long term complication following pelvic irradiation. In recent times, with the revolutionary advancement in the total radiotherapy dose administration and protective shielding techniques, the incidence of post irradiation AVN of the hip joint and its resultant disability has been drastically reduced. The treatment modality is based on pre- operative staging and in most of the times it is surgical rather than conservative. Core Decompression, Cortical Bone Grafting and Allograft procedure are advised in management of early stages .Whereas, Arthrodesis and Excision or Replacement Arthroplasty is advised in management of late stages of AVN of the hip joint

Ethical Clearance –Taken from Sir Gangaram hospital ethical committee.

Source of Funding – Self

Conflict of Interest -NIL

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Assessment of Functional and Radiological Outcome of Proximal Lateral Condyle Fracture of Tibia (Schatzker Type 1, 2 and 3) Fixed with Locking Compression Plate and Screw

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ABSTRACT

Background: Tibial plateau fracture commonly occurs in road traffic accidents and sports injuries. These fractures are intra-articular and difficult to treat. Age, skin conditions, osteoporosis further increase the obstacles in the healing process that can produce permanent disabilities and their treatment is often challenged by severe fracture comminution.

Method: All patients underwent X-ray and CT scan for assessment of type of fracture, depression of articular surface and also to decide plan of treatment based on displacement. The fractures were stabilized with the single lateral insertion of locking compression plate (LCP-).Patients were followed regularly at 2 weeks, 1 months, 3months and 6 months for functional assessment with pain, range of motion, stability and radiological assessment.

Results: Union was achieved in all 35 cases., 17 patient had 130 degree of flexion(48.6%), 29 patient had no extensor lag (82.9%) , 19 patient had excellent stability(54.3%), 30 patients (85.7%) had no plateau tilting post operation while 5 patients (14.3%) had tilting, 20 patients (57.1%) had no articular step off, 10 patients (28.6%) had 1-3 mm step off, 3 patients (8.6%) had 3-6 mm step off and 2 patients (5.7%) had more than 6 mm step off. 33 patients (94.3%) had no varus or valgus deformity post reduction while 2 patients (5.7%) had some varus or valgus deformity. None of our patients showed post traumatic degeneration of the articular cartilage till 6 months of follow up. Only 5 patients (14.3%) had post-operative complications.

Conclusion: The internal fixation of proximal tibial lateral condyle fractures with use of locking compression plate yields reliable results when utilized correctly. Locking compression plate allows fixed stable fixation with early mobilization and rehabilitation.

Keywords*: lateral plateau fracture, Schatzker type 1, 2 and 3, locking compression plate*

INTRODUCTION

Tibial plateau fractures constitute 1% of all fractures and 8% of fractures in the elderly.[1] Isolated injuries to the lateral plateau account for 55% to 70% of tibial plateau fractures, as compared with 10% to 25% isolated medial plateau fractures and 10% to 30% bicondylar fractures. Lateral tibial plateau fractures are associated with other soft tissue injuries like cruciate and collateral ligament injuries and meniscal tears. Typical mechanisms include a combination of axial loading and angular forces, which result in a split/depression of the tibial plateau along with metaphyseal impaction and comminution. Despite all reconstructive efforts osteoarthritis following tibial

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plateau fractures is reported to evolve in 23-44%. In order to decrease the incidence of complications, particularly of fixation failure, loss of stability, collapse, locking compression plate have been developed to improve stability and enable early post operative mobilization. Many people have studied these fractures and their management modalities and no single consensus have been reached at regarding the superiority of any modality. This proposed study is a prospective, nonrandomized, observational study of 35 cases of lateral tibial condyle fracture fixed by locking compression plate and screw to evaluate the functional and radiological outcome of such treatment.

MATERIAL AND METHOD

All patients who were aged from 18 to 70 years and were diagnosed as having a proximal tibial fracture (Schatzker type 1, 2 and 3). The fractures were stabilized with the single lateral insertion of locking compression plate (LCP-) at the authors' institutions from January 2017 to June 2017. All patients were selected on basis on following strict inclusion and exclusion criteria's.

INCLUSION CRITERIA:-

1. All closed fracture of lateral condyle of tibia.
2. Schatzker type 1, 2, and 3.
3. Tscherne and Gotzen C0 and C1.
4. Age 18-70yrs.

EXCLUSION CRITERIA:-

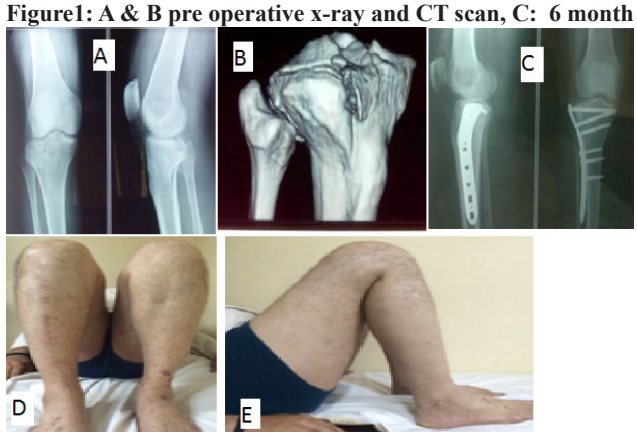
1. Compound fracture
2. Mid-shaft fracture
3. Schatzker type 4, 5, and 6.
4. Tscherne and Gotzen C2 and C3.

All patients were examined clinically and radiologically and underwent CT scan for further assessment of type of fracture, depression of articular surface and also to decide plan of treatment based on displacement. All fractures were classified according to Schatzker's classification. All patients were applied above knee pop slab and lower limb was kept elevated over the Bohler frame till the time of surgery. All pre-operative investigation and counselling of the patient and his/her relatives regarding the method of treatment and prognosis were explained and consent for surgery and for research study was taken.

Surgical Procedur:-

All surgery done through anterolateral approach to lateral tibial plateau , If the articular surface was depressed then a cortical window was made over lateral surface of tibia and surface was elevated using radius ulna punch and the void remaining after elevation was filled either by iliac crest bone graft or by allograft. After this LCP was fixed to the lateral surface of tibia by k wire and then locking screws were applied to fix the fracture. Fracture reduction and plate placement were checked under the image intensifier. Patients with ligament injuries were applied plaster slab to prevent instability. Appropriate IV antibiotics and anti-inflammatory drugs for pain relief were given for first 3 days. Patients were discharged on oral medication and advised not to bear weight on operated leg for at least 4 weeks, also advised to do toes movements. All patients were followed regularly at 2 weeks, 1 months, 3months and 6 months. (Figure 1)

Figure1: A & B pre operative x-ray and CT scan, C: 6 month follow up x-ray



D&E shows normal range of motion at 6 month follow up

OBSERVATIONS AND RESULTS

No patient was lost in the follow up of 6 months. The observations of our study are analyzed using statistic package for social science (SPSS software version 11.5) by using Chi square test for comparison of quantitative parameters. P value <0.05 is considered statistically significant.

- In our study age ranged from 18 to 70years.The average age in our study group was 38.74 years .The males and female were 26 and 9 respectively. Road traffic accident was most common mode of injury.

- Out of 35patients, 15 patients (42.9%) classified as Schtazker'stype 1 fracture, 11 patients (31.4%) had type 2 fracture and 9 patients (25.7%) had type 3 fracture.
- 11 patients (31.4%) had 0-1mm displacement of the fracture fragment, 5 patients (14.3%) had 1-2mm and 19 patients (54.3%) had >2mm displacement. While only 13 patients (37.1%) had associated ligament injury.
- We reported that 10 patients (28.6) stayed between 1 to 5 days in hospital, 22 patients (62.8%) stayed between 6 to 10 days while 3 patients (8.6%) stayed for more than 10 days in hospital.
- In our study 30 patients (85.7%) had no plateau tilting post operation while 5 patients (14.3%) had tilting. 20 patients (57.1%) had no articular step off, 10 patients (28.6%) had 1-3 mm step off, 3 patients (8.6%) had 3-6 mm step off and 2 patients (5.7%) had more than 6 mm step off. 33 patients (94.3%) had no varus or valgus deformity post reduction while 2 patients (5.7%) had some varus or valgus deformity. None of our patients showed post traumatic degeneration of the articular cartilage till 6 months of follow up.
- We observed that 29 patients (82.9%) had no postoperative extensor lag, 5 patients (14.3%) had 1 to 5 degree extensor lag, 1 patient (2.9%) had 6 to 10 degree lag . 17 patients (48.6%) had 130 degree of flexion after surgery, 15 patients (42.9%) had 110-129 degree flexion, 2 patients (5.7%) had 90-109 degree flexion and only 1 patient (2.9%) had less than 90 degree flexion. 19 patients (54.3%) had no thigh atrophy on follow up, 4 patients (11.4%) had 0-1mm atrophy, 11 patients (31.4%) had 1-3mm atrophy and 1 patient (2.9%) had more than 3 mm atrophy. 19 patients (54.3%) had excellent ligament stability postoperative, 9 patients (25.7%) had good, 6 patients (17.1%) had fair and 1 patient (2.6%) had poor ligament stability.
- 30 patients (85.7%) healed without any complications; only 5 patients (14.3%) had post-operative complications. One patient developed deep infections that required operative debridement. Two patients developed superficial wound dehiscence, two patients had hardware irritations.
- We tried to find association between type of fracture and functional outcome and found that most of the type 1 fractures14 out of 15 had excellent to good results. Type 2 had 10 out of 11 &type 3 fractures had 8 out of 9 also had excellent to good results.
- We found that patient with less than 2 mm displacement out of 16, 9 had excellent results while 7 had good while patients with more than 2 mm displacement out of 19, 8 had excellent and 8 had good results.
- In our study patients with no articular step off had excellent to good results none had fair or poor results. Patients with step off 1-3 mm 4 had excellent and 4 had good results while 1 had fair and 1 had poor results. Patients with step off 4-6 mm none had excellent results while 2 had good and 1 had fair results. Patient with more than 6 mm step off one had excellent result and 1 had good result.

DISCUSSION

Various techniques have been used to stabilize the fracture of lateral tibial condyle including cancellous cannulated screws, k-wires, above knee plaster cast, T-shaped buttress plate. Open reduction and internal fixation of the lateral condyle of tibia with buttress plate is most commonly used but in some patients during follow up there was loss of reduction or collapse of articular cartilage. These might be due to property of the plate or improper post operative rehabilitation. There is debate about efficacy of the different modalities. Various studies have been done in the past regarding the tibial plateau fractures- by M. Hohl, Apley, Rasmussen, Schatzkar and others[2, 3, 4, 5]. But all these studies included either conservative method or operative method. Some included both conservative as well operative.

In our study average age of patient was 38.7 years in total 35 patients. Readmaker et al.[6] In their study on tibial condyle fractures had mean age of 46 years. Jensen et al.[7] in their study had average age of 55 years. The average age reported by various workers is between 47 -57 years. Schatzkar, Burriet al.[5] have reported a incidence for males between 40-67 years and for females between 33-60years. This is due to the fact that this is the working age group with increased mobility.

Road traffic accidents were the major cause of lateral tibial condyle fractures in our study. Total 91.4% fractures were caused by road traffic accidents and remaining 8.6% were by falls. M. Hohl in his study on tibial plateau fractures cited that road traffic accidents were the main cause of tibial plateau fractures.[2]

In our study type I fracture that is split fractures were most common representing 42.9% of the fractures while type 2 fractures that are split with depression accounted for 31.4% fractures with type 3 that is pure depression being 25.7% only. This may be due to the fact that type 1 and 2 fractures occurs when the bone quality is good as in young adults and in our study most of the patients are in young age group while type 3 fractures occur in older age group when there is osteoporosis. This fact was also mentioned in Schatzkeret al.[5] study, which mentioned that type 2 fracture is the most common and type 1 is the least common. In his study of 70 patients only 4 patients had type 1 fracture. Hohl also found the same observation that type 1 is the least and type 2 is the most common.[2]

We found that in type 1 fracture out of 15 patients 14 had excellent to good functional outcome. In Schatzker's original report, which described the six fractures types, the only type that had all satisfactory results was type 1 lateral split fractures.[5]

In type 2 out of 11 patients 10 had excellent to good outcome. There were mixed review regarding this fractures from other researchers in which Keating[8] found worst result while Ali et al.[9] reported a high percentage of patients lost reduction after surgical treatment. Also Savoie et al.[10] reported 18 of 21 and Lachiewicz[11] reported 16 of 17 good to excellent results in operatively treated split depressed fractures.

In type 3 fractures 8 out of 9 patients had excellent to good outcome.

In our study pre-operative displacement of fracture was calculated using CT scan. In our study we tried to find association between initial fracture displacement and functional outcome, in those patients with 0-1mm displacement out of 11 all 11 patients had excellent to good outcome. Patients with 1-2 mm out of 5 all 5 had excellent to good outcome and in patients with more than 2 mm displacement 16 out of 19 patients had excellent to good outcome. So initial displacement didn't have any association with final outcome in our study. Conolly JF[12] et al, Lansinger O[13] et al., Redmakers MV[6] et al., Schwartsman R[14] et al. thought that limb alignment was more important than articular step off.

In our study 13 out of 35 patients had associated ligament injuries (37.1%) and 22 patients had no ligament injuries (62.9%). In one recent study by M. Parkkinenet al.[15] out of 50 patients ligament injuries were noted in 22 patients (44%). In our study in patients with ligament injury out of 13, 12 had excellent to good results while in patients without ligament injuries out of 22, 20 had excellent to good results. Same results were found in M. Parkkinenet al.[15] study.

In our study plateau tilting was not seen in 85.7% patients, 1-5 degree in 14.3% patients and none had more than 5 degree plateau tilting. We also tried to find association between plateau tilting and functional outcome. We had 30 patients with no tilt out of which 29 patients had excellent to good results while 5 patients had 1-5 degree tilt out of which 3 had excellent to good results while 2 had fair results.

In our study 48.6% had 130 degree or more than that flexion post operation which according to our criteria was considered excellent outcome, 42.9% patients had range of motion between 110-129 degree and was considered good outcome. 5.7% and 2.9% patients had range of motion 90-109 degree and less than 90 degree respectively. Later range was considered poor.

In our study 54.3% patients had no post operative thigh atrophy and were considered excellent result, 11.4% patients had 0-1mm atrophy and was good, 31.4% patients' had1-3mm atrophy and was considered fair while 2.9% patient had more than 3 mm atrophy. To regain muscle strength post operative quadriceps exercise is adviced.

In our study 5 patients had some post operative complications one patient developed deep infections that required operative debridements. Two patients developed superficial wound dehiscence, two patients had hardware irritations. Parkkinenet al.[15] in their study also had no infection and loss of reduction but one patient developed deep venous thrombosis and had to perform two early revisions.

CONCLUSION

Stable internal fixation with proper alignment is the key for successful functional outcome of proximal

tibial lateral condyle fractures management. The internal fixation of proximal tibial lateral condyle fractures with use of locking compression plate yields reliable results when utilized correctly. Locking compression plate allows fixed stable fixation with early mobilization and rehabilitation.

Ethical Clearance– Taken from Sir Gangaram hospital ethical committee

Source of Funding – Self

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Organizational Context and Leadership in the Integration Role of Health Care Provider of Integrated Antenatal Care Team in Public Health Centre

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ABSTRACT

There are 15% of complications that occur during pregnancy can cause death. These complications can be life-threatening, but they can be prevented and treated effectively by an integrated antenatal care team in public health centre (PAcTP). This research aim to determine the effect of organizational context and leadership toward Integration Role of Health Care Provider (IRHCP) of PAcTP. This research use observational analytic with the cross-sectional approach on 40 PAcTP teams in Malang, data analysis using multiple regression. Organizational context (power distribution and team structure) and leadership (ability to lead and give a positive influence) related to IRHCP (Coefficient β = 0.923, p-value = 0.001 and Coefficient β = 0.930, p-value = 0.001). In a team, a good IRHCP can be realized if the organization has a good organizational context, as well as good leadership as well.

Keywords*: organizational context, leadership, integration, health care provider, antenatal care*

INTRODUCTION

The organizational context becomes one of the factors affecting team effectiveness. The effectiveness of the work team is based on two outcomes, productive outcomes and personal satisfaction. Productive outcomes relate to the quality and quantity of work as defined by the team objectives. Satisfaction with the team's ability to meet the personal needs of its members and then maintain their membership and commitment to remain in the team. With a good organizational context, it will be able to set a good relationship also among members of the team, so as to produce something good for the team.

Leadership in this research is the leadership of Head of Primary Health Care (PHC). The ability to lead the head of PHC in carrying out the management function is also something that must exist for the achievement of organizational goals. When a team feels a high organizational context, such as a team mission that aligns with an organization's mission, it will be more appropriate to achieve a higher quality improvement. A team with high performance will then be able to achieve high organizational goals as well. The organizational context in this study is measured by two indicators namely team structure and power distribution.[1]

The team structure referred to in this study is how the arrangement or relationship between the part and position that exist on the team in carrying out operational activities to achieve the expected goals. Based on the results of the research results, it is known that from 40 PHC conducted research, the team structure in the context of the organization is mostly sufficient category.

The existence of power distribution or good authority sharing in a team is one of the important factors in supporting the organizational context. Power distribution in this research is a delegation of authority performed by the head of PHC to team member according to authority and capacity of a team member, to support the creation of good service quality. The sharing of authority in this

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team can provide clarity for team members to perform their duties well in accordance with the competencies that are the responsibility. It also prevents the possibility of overlapping work, waste and mutual responsibility whenever something goes wrong and difficult.

One of the things that can improve the team is with the division of good authority within the team. With the power distribution can make people increase their skills in handling tasks because the task is in accordance with the field it has. This means that in the division of labor there must be an adjustment between the ability and type of work to be addressed, in addition, accompanied by procedures and work disciplines that are easily understood by the members concerned.[2]

Although the power distribution may be done in a team, the leadership must still prevent the transfer of all authority to the team members. The leader needs to outline clearly and clearly the responsibilities of its members over the use of the authority that has been delegated to it is limited in relation to carrying out its duties and functions, and encourages members to accept the delegation of authority from the leadership and to carry out their duties and responsibilities as well as possible.

The leadership of the head of PHC also becomes a supporter of the team, explaining the existing leadership phenomena in a team. The ability to lead the head of the PHC in the team is defined as how the head of the PHC communicates with team members, provides motivation, creates a good teamwork atmosphere within the team to achieve the stated goals. It can be believed that without the head of the PHC in the team, the team will not succeed to combine the contribution of each of its members in achieving the same end goal. Leadership is a relationship that exists within the leader to influence others to be willing to work consciously in a task relationship in order to achieve the desired goal.[3]

A leader in carrying out a task must be able to be a good example so that members who are under it will consciously perform the task as well as possible. Head of PHC must be able to give orders, but still must be accompanied by directive and guidance to PAcTP team in providing integrated antenatal service to the client. With the ability to provide this positive influence, it can spur the productivity of work members in working and achieving common goals.

The results of the IRHCP factor analysis test for the indicator, in line with the opinion that there are several things that can be used to determine whether integration can be done well in a team. IRHCP in the team can be realized well, marked by the collective responsibility, common goals, good communication, role collaboration and not an overlapping job.[4] Collective responsibility relates to how team members perform joint responsibilities to achieve team goals.[5] This is a must that must be implemented and completed by the members of the PAcTP team created by the acceptance of authority from the PHC head. The PAcTP team must always be jointly accountable to the leadership. Authority accepted then responsibility should also be accepted as well as possible.

Common goals relate to collective goal agreements in teams that are used as member signs to provide integrated antenatal care. If team members agree with the goal, it will make the team more compact. Team members have the same feelings and views about the purpose of the action taken.[6]

Good communication deals with the process of delivering information, thoughts, and ideas presented in the team.[7] Not overlapping jobs are associated with non-overlapping work perceived by members of the PAcTP team. Not overlap jobs in the PAcTP team include whether there are duplications of work done by team members, whether there are similar workloads among team members, whether team members handle the work is in accordance with the part, and whether the team members ever finish a job that is not his responsibility.

MATERIALS AND METHOD

This research uses an observational analytic research design. This research was conducted through survey method for data collection conducted questions and answer with questionnaire and interview. The study design used cross-sectional design. Statistical methods using multiple regression and path analysis analysts.

RESULTS AND DISCUSSION

The result of organization context indicator relate to IRHCP as follows:

Table 1. Test Result of Organizational Context Indicator in PAcTP Team

Indicator of Organizational Context	Coefficient B	T Value	p-value	R-square score
Power distribution	0.340	3.189	0.003	0.859
Team structure	0.629	5.908	0.001	

Table 1 shows that the team structure indicator has the greatest influence on IRHCP with a β coefficient value of 0.629 and t value = 5.908. The influence of the organizational context on IRCHP can be described as follows:

Table 2. The Influence of Organizational Context on IRHCP to PAcTP Team

Organizational Context	IRHCP						Total	
	Less		Enough		Good			
	n	%	n	%	n	%	n	%
Less	9	90	1	10	0	0	10	100
Enough	1	4,8	18	85,7	2	9,5	21	100
Good	0	0	1	11,1	8	88,9	9	100
Total	10	25	20	50	10	25	40	100
Uji X2, a **= 0.05, p = 0.0001**								

Table 2 shows that the influence of the organizational context on IRHCP has a significant effect. It can be seen from chi-square test result, obtained p-value = 0.0001 at α = 0.05, which means that organizational context has a probability to influence IRHCP. It can be concluded that the better the organizational context in the PHC, the IRHCP in the PAcTP team tends to increase.

Table 3. The Regression Analysis of Organizational Context to IRHCP

Indicator of Leadership	Coefficient B	T Value	p-value	R-square score
Organizational Context à IRHCP	0.923	14.763	0.001	0.852

The result of regression analysis shows that the organizational context has strong influence to IRHCP that is equal to 0.923. The value of R-square is 0.852 with significance value p-value = 0.001, which means that 85.2% IRHCP is influenced by organizational context and the rest is influenced by another variable not examined in this research.

The results of the analysis explain that the organizational context has a significant effect on IRHCP. The value of the positive influence means that the value of influence is unidirectional, indicating that if the organization context is improved it will increase IRHCP in the PAcTP team. The organizational context in this study is intended as support or contribution of PHC which viewed from the role of PHC head to support the continuity of work in PAcTP team during this time.

The indicators that can improve the organizational context in the PAcTP team that has the most powerful influence are the team structure. This suggests that in order to enhance the integration of the PAcTP team, a clear team structure becomes the most important requirement that must be met. The structure is the relationship between the various functions or activities within a team. The results of the review literature make it clear that clarity of job descriptions in the team structure is very helpful for the leadership to conduct supervision and control, and for members will be able to concentrate on carrying out a job because the job description is clear. This is in fact related to the clarity of the position of the member, which may facilitate the coordination or

relationship due to the interconnection of a function entrusted to team members.[8]

The structure of the organization as an arrangement and the relationship between component parts and position within a company. The organizational structure describes the framework and relationships among the functions, sections and also the division of activities. The organizational structure also describes hierarchies within the organization, including different powers and responsibilities. Based on the results of research and rationality built it has been proven that the purpose of the existence of this team structure is to assist in organizing and directing the efforts of the organization so as to facilitate coordination and consistent with organizational goals.[9]

Table 4. The Leadership Indicator to IRHCP

Indicator of Leadership	Coefficient B	T Value	p-value	R-square score
Leadership ability	0.810	14.602	0.001	0.888
Positive influence	0.585	10.552	0.001	

Leadership ability indicator has the most influence on IRHCP, coefficient β value 0.810 and t value = 14.602.

Table 5. The Influence of Leadership to IRHCP

Leadership	IRHCP						Total	
	Less		Enough		Good			
	n	%	n	%	n	%	n	%
Less	10	71,4	4	28,6	0	0	14	100
Enough	0	0	13	81,2	3	18,8	16	100
Good	0	0	3	30	7	70	10	100
Total	10	25	21	52,5	9	22,5	40	100
Uji X2, a **= 0.05, p = 0.0001**								

Table 5 shows that the influence of leadership on IRHCP which has significant influence. It can be seen from the result of the chi-square test, obtained p-value = 0.0001 at α = 0.05, which means that leadership has a probability to influence IRHCP. It can be concluded that the better the leadership of the head of PHC, the IRHCP that occurs within the PAcTP team tends to increase.

Table 6. The Regression Analysis of Leadership to IRHCP

Influence Variable	Coefficient B	T Value	p-value	R-square score
Leadership à IRHCP	0.930	15.538	0.001	0.864

The result of regression analysis shows that the influence of leadership on IRHCP which has significant influence. It can be seen from the result of the chi-square test, obtained p-value = 0.0001 at α = 0.05, which means that leadership has a probability to influence IRHCP. It can be concluded that the better the leadership of the head of PHC, the IRHCP that occurs within the PAcTP team tends to increase.

The results obtained on the β coefficient value, indicating that leadership has a strong influence on IRHCP that is equal to 0.930. R-square value is 0.864 with significance value p-value = 0.001, which means that 86.4% IRHCP is influenced by leadership and the rest is influenced by other variables not examined in this research.

Team effectiveness model, when used to explain

IRHCP, can be represented in the form of support and leadership role in it. Leaders (head of PHC) that is required to be able to generate team members' loyalty, able to educate team members, provide advice and advice from existing problems and can provide exemplary in discipline and discipline in every activity. If the head of the PHC can establish good communication with the PAcTP team, can provide good examples, and be able to provide support for members within the team, good integration of teams will be achieved easily.[10]

The results show that leadership of PHC heads in the lead has the strongest influence on the occurrence of IRHCP. This leadership capability includes a broad understanding of how the PHC head communicates, how the head of the PHC motivates team members to continue to improve their performance, leadership style and how the head of the PHC is able to create a good family atmosphere within a team. If the head of the PHC is successful in leading the team, then the organization's goals will be easily achieved.

The task of a leader is to be able to provide clear information and for that must have the ability to communicate well and smoothly. This will make it easier for subordinates to capture what a leader wants for both short and long-term. If a leader in transferring information is difficult to understand and understand by his subordinates or employees, it will cause problems, because within the team consists of a variety of different individual characters. This problem is caused because on the one hand want the work program in the team for the achievement of organizational goals achieved, but the team members feel confused or difficulty must work how to be able to achieve organizational goals. So in this case, the ability to communicate with a leader really plays an important role in facilitating integration within the team, in an effort to achieve organizational goals.[11]

CONCLUSION

The concept of organizational context used to strengthen IRHCP can be represented in terms of power distribution and team structure. Based on the results can be concluded that the better the organizational context, then followed by the better IRHCP as well. Leadership used to strengthen IRHCP can be represented in the form of leadership ability and ability to exert a positive influence. Based on the results can be concluded that the better, then followed by the IRHCP the better also.

Ethical Clearance: Before conducting the data retrieval, the researchers conducted a decent test of ethics conducted at the Faculty of Public Health Airlangga University to determine that this study has met the feasibility. Information on an ethical test that the study is eligible to continue. The feasibility of the research was conducted in an effort to protect the human rights and security of research subjects.

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Study on Leaf Segmentation Using K-Means and K-Medoid Clustering Algorithm for Identification of Disease

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ABSTRACT

The aim of this paper is to study and compare the analysis of the most commonly used clustering algorithms like K-means and K-medoids based on their basic approach. Clustering is a common method used to segment the images. It is the process of grouping similar objects into different clusters or more precisely, the partitioning of a data set into subsets according to some defined distance measure. It is an unsupervised learning technique, which groups the data in large data sets into different patterns and structures by simple measures. It is widely used in many fields, including machine learning, data mining, pattern recognition, image analysis and bioinformatics. In this research clustering algorithms K-means and K-Medoids were examined and analyzed. From the results, it is found that K-means performs well in situations when the disease is easily divisible from the leaf as it calculate the distance based on the means value.

Keywords: *Leaf, Segment, Image, Clustering Algorithm, Disease*

INTRODUCTION

Segmentation is a method of separating an image into various segments. The main aim of segmentation is to improve and change the representation of an image into more meaningful and make the image to analyze. It is used to locate objects and boundaries present in the images [1-5]. More specifically, image segmentation is a method of assigning a label to every pixel in an image such that pixels with the same label share certain characteristics [6-10]. Clustering is one of the segmentation methods which divide the different regions in an image based on some characteristics. Image segmentation is one of the mostly used methods to classify the pixels of an image correctly in a decision oriented application [11-15]. It divides an image into a number of discrete regions such that the pixels have high similarity in each region and high contrast between regions. It is a valuable tool in many field including health care, image processing, traffic image, pattern recognition etc [16-20]. There are different techniques for image segmentation like threshold based, edge based, cluster based, and neural network based. From the different technique one of the most efficient methods is the clustering method [21-24]. Again there are different types of clustering: K-means clustering, Fuzzy C-means clustering, mountain clustering method and subtractive clustering method. One of most used clustering algorithm is k-means clustering [25-28]. It is simple and computationally faster than the hierarchical clustering [29-31]. Based on the above study, in this research, K-means clustering and K-medoids clustering algorithms are used for segmentation of leaf for identification of disease on it.

CLUSTERING ALGORITHMS

K-Means Clustering

K-means clustering is a simplest method among unsupervised learning algorithms which solves the well-known clustering problem. Let X = {x_i}, i=-1, … .,N the set of N dimensional points to be clustered into a set of K clusters C={c_k, k=1,. . .K} . K-means algorithm allows finding a partition such that the squared error between the empirical meaning of a cluster and the points in the cluster is reduced. Let μ_k be the mean

of cluster c_k. The squared error between μ_k and the points in cluster c_k is defined. The main goal of K–means is to minimize the sum of the squared error among all K clusters. Reducing this objective function is known to be a non-deterministic polynomial time (NP) hard problem. Accordingly K-means can only converge to a local minimum. K-means starts with an initial partition with K clusters and allocates patterns to clusters so as to reduce the squared error. Since the squared error always reduces with an increase in the number of clusters K, it can be limited only for a fixed number of clusters. This clustering technique needs three parameters in manual by the user: number of clusters K, cluster initialization, and distance metric. The most important choice is K. The algorithm focuses at minimizing the target function as follows

There are several steps involved in K-means algorithm execution. Place K points into the space denoted by the objects that are being clustered and these points represent initial group centroids. Then allot each object to the group as the nearest centroid. Once all the data points have been assigned, recalculate the positions of the K centroids. Repeat the process until the centroids no longer move. This produces a separation of the objects into groups from which the metric to be minimized can be calculated. The K-means algorithm stops if a specified error condition is met, or after a given number of iterations or if fewer than a specified number of objects change clusters. Although it is simple and relatively fast, the K-means algorithms are a gradient descent method and thus may be trapped in local minima. So it may be necessary to run the algorithm multiple times with a different set of initial cluster centers to find the optimal solution. K-means is specifically used with the Euclidean metric for computing the distance between points and clusters centers and as a result, K-means finds spherical or ball shaped clusters in the given data.

K-Medoids Clustering

K-medoids is a clustering algorithm almost similar to the K means algorithm and the medoid-shift algorithm. K-means and K-medoids algorithm works by splitting the dataset up into groups and both aims to reduce squared error, the distance between points labeled to be in a cluster and a point designated as the center of that cluster. Rather than K-means algorithm, K-medoids picks data points as centers. K-medoids is likewise a partitioning technique of clustering that clusters the given data set of n objects into K clusters with k a known priori. Given similarity values between every pair of data objects, an iterative learning process can group data objects into clusters to increase the sum of similarity values for each cluster. That is, the point at which the sum of similarity values is maximized, K-medoid algorithm groups data objects of equal to or lesser than similarity value in one cluster. The choice limits that are created by a given K-medoid model are the perpendicular bisector hyper plane of the line segment from the medoid of one group to another i.e. the change of data distraction in a cluster may be different. The most widely used realization of K-medoid clustering is the partitioning around medoids technique.

Similarly, there are many steps are involved while execution of K-medoid algorithm. Arbitrarily select k of the n data points as the medoids. Relate each data point to the nearest medoid. For each medoid 'm' and each data point 'x' related to m, swap and x and process the total cost of the configuration i.e. the average dissimilarity of x to all the data points related to m. Select the medoid x with the lowest cost of the configuration. Repeat the procedure until there is no adjustment in the assignments. Since the solution of medoids is located in the sample space, which is discrete, the finding of medoids normally needs to be accomplished with heuristic search techniques. This is not same as the case of K-means, in which centroid of each cluster can be updated iteratively because the centroid is a variable in continues space.

RESULTS AND DISCUSSION

In this research, the proposed automated segmentation technique was implemented to identify the shapes of different plant leaf images. The experiments are conducted using MATLAB 7.0. Twelve leaf images are taken as benchmark images. There are four steps are involved to segment the image using clustering algorithms such as leaf image is taken, input image is preprocessed, clustering algorithm is applied and Regions of Interest (ROI) from each cluster is obtained. The proposed method flow chart for segmentation of leaf is shown in Figure 1.

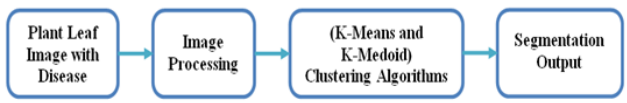

Figure 1 Proposed Method Flow Chart for Leaf Segmentation

Figure 2 Specimens of Input Image

Figure 3 K-Medoid Clustering Results

Figure 4 K-Means Clustering Result

Table 1: Hard Clustering Results

Image	K-Means		K-Medoid	
	RMSE	PSNR	RMSE	PSNR
Specimen 1	0.0076	33.50	0.008	33.40
Specimen 2	0.0012	37.10	0.004	31.78

The output results obtained through hard clustering are shown in Figure 2 and Figure 3. From the results it is observed that, the performance of K-means is higher compared to K-medoid. The Root Mean Square Error (RMSE) and Peak Signal to Noise Ratio (PSNR) values are calculated for classical K-medoid algorithm as well as K-Mean method. The results of hard clustering for both the specimens are given in Table 1. The values of RMSE are getting very low and the value of PSNR is getting above 30 and when both methods are compared it is found that the K-mean method has better result. So we can conclude that the output image resulted from the K-mean algorithm are of good quality.

CONCLUSION

Study and analysis of leaf segmentation using k-means and k-medoid clustering algorithm for identification of disease was carried out. From the observed results the following conclusions were arrived.

The results obtained by both the clustering algorithms are compared for their segmentation accuracy.

It is found that k-means performs well in situations when the disease is easily separable from the leaf as it calculate the distance based on the means value.

The real challenge with the k-means is the effect of outliers which results in poor segmentation accuracy. Based on the analysis proper preprocessing will result in good segmentation result.

K- Medoid also performs equally well when compared to K-Means.

Ethical Clearance: Taken from the advisory committee of ACS Medical College and Hospital, Chennai, India.

Source of Funding: Self

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Wireless ECG Monitoring System using IoT based Signal Conditioning Module For Real Time Signal Acquisition

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ABSTRACT

Recently, in human health care scenario most of the people are suffering by arrhythmia which is a type of the cardiovascular diseases and it occurs during a person has irregular or abnormal heart rate. To diagnose such condition, there should be continuous monitoring of electrocardiogram signal irrespective of the location confined to the subject and the appropriate physician. In this research, wireless ECG monitoring system using AD8232 signal conditioning module for real time signal acquisition was proposed. The proposed system performs continuous ECG signal monitoring that integrates Wi-Fi technology which acquires the ECG signal and transmit it to cloud wirelessly. Also, feature extraction algorithm has been developed to extract features such as RMSSD, SDNN, Mean RR, Ratio SR and slope of linear regression of IBI from ECG signal of BioVid Heat pain database for different pain levels. The same feature extraction algorithm can be applied on real time ECG signal to extract the features. From the results, it is clear that the proposed system is advantageous for the physicians to provide the right health care to the subject without being in close proximity.

Keywords: *Health care, Cardiovascular, ECG, IoT, BioVid*

INTRODUCTION

In current decades, it was clearly found that on every occasion a person is exposed to excessive work leads to exhaustion. If this condition prevails for long time and remain unattended, it may lead to cardiovascular diseases. During this emergency situation, if the person could not get immediate medical care, the chances of demise become very high. Therefore a health care system for monitoring the Electrocardiogram (ECG) signal wirelessly and the machine learning process to classify ECG signals would be a smart way to diagnose the cardiovascular diseases such as arrhythmia. The proposed method undergoes the implementation of wireless monitoring of ECG signal based on Wireless Fidelity (Wi-Fi) technology and features are extracted from the BioVid heat pain database which will be used for high accuracy ECG signal classification. ECG signal monitoring system is portable with wireless transmission capabilities. In this method, ECG signal from the subject is acquired using data acquisition module and microcontroller. The acquired signal is transmitted to IBM Watson Internet of Things (IoT) cloud server using Message Queuing Telemetry Transport (MQTT) protocol and the real time ECG signal is monitored. Features such as mean of RR Interval, Root Mean Square Successive Differences (RMSSD), Standard Deviation of Normal to Normal (SDNN) intervals, Strontium Ratio (SR), slope of linear regression of Inter Beat Interval (IBI) are extracted from the ECG signal of BioVid heat pain database for five different conditions like BL-1, PA-1, PA-2, PA-3 and P-A4), which can be further used to perform classification in order to predict arrhythmia.

LITERATURE REVIEW

A bio-signal acquisition and classification system for diagnosing heart disease has been discussed in which ECG signal is acquired and transmitted using bluetooth wireless sensor network for short distances and it is classified at the receiver end [1-3]. Transmission of biomedical signal is performed using the bluetooth

module which mainly focuses on signal acquisition that takes place after filtering and amplifying the signal [4-6]. In ECG signal quality assessment method, the quality of acquired ECG signals is assessed under resting, ambulatory and physical activity environments using matrix laboratory software called MATLAB [7-9]. Small wearable sensors capture, process and transmit the ECG signal to the doctor using the bluetooth module and the abnormalities are observed and diagnosed accordingly [10-12]. Taken ECG signals from analog discovery tool and processed the sampled data of the signal using CC3200 before transmitting to the cloud by means of Wi-Fi technology. Removal of noise and feature extraction of ECG signal is depicted in which undergoes the removal of baseline wandering of ECG signal using butter worth filter and the statistical features are extracted using discrete wavelet analysis [13-15]. Median filter is used for signal de-noising and statistical feature extraction along with Support Vector Machine with Radial Basis Function (SVM-RBF) classification has been performed by about 90% efficiency [16-19]. Different feature extraction methods for analyzing the classification of the ECG signal has been studied. Features are extracted using Discrete Wavelet Transform (DWT), statistical method, time domain and frequency domain methods [20-24]. Signals are taken from a research institute hospital arrhythmia database in which artifact signals are removed in the preprocessing stage and Quick Response Services (QRS) complex detection is performed to locate heart beats for segmentation and ECG signal is classified [25-29]. Based on the above literature an attempt was made to implement wireless ECG signal monitoring system and feature extraction from ECG signal in BioVid heat pain database was carried out.

DATA COLLECTION AND ANALYSIS

The ECG signal in BioVid heat pain database has been recorded for 5.5 seconds long and is digitized at 512Hz. It consists of five different conditions of BL-1, PA-1, PA-2, PA-3 and PA-4. From the results, it was found that, BL-1 indicates no pain condition and the series of PA indicates the increase in pain level from PA-1 to PA-4. Each pain and no pain condition consists of twenty recordings and totally one hundred recordings are present. The recording for each condition of ECG signal is concatenated and plotted accordingly. R-peaks are located in the plotted ECG signal from which Risk Ratio Interval (RRI) is obtained and by means of RRI, features are extracted using the standard equations.

TECHNIQUE PROPOSED

Execution of Wireless ECG Monitoring System: The proposed method involves the execution of wireless ECG signal monitoring system and feature extraction from ECG signal in BioVid heat pain database. The ECG monitoring system consists of several modules like ECG signal conditioning module, data acquisition and Wi-Fi module and cloud server. The initial part of the system consists of three ECG electrodes placed on right arm, left arm and left leg or right leg of a human. The corresponding electrode jack is connected to ECG AD8232 signal conditioning module. The analog output from AD8232 is fed to 12bit resolution analog-to-digital converter (ADC) of CC3200 IoT kit which operates at maximum of 1.46V. The value of ECG signal inferred from AD8232 ranges from 1.65V-2.25V hence, the signal value is down converted to 1.46V by designing and implementing a voltage divider circuit. Voltage divider circuit is designed with the specifications as R1=1KΩ, R2=1KΩ, V_{in}=1.65V and V_{out}=0.82V. The output signal from the AD8232 is given to one end of resistor R1 and common ground (GND) is given for the circuit. The output voltage from voltage divider circuit is given to ADC. The digital values are displayed in serial monitor of Energia integrated development environment (IDE) tool. The CC3200 IoT kit is programmed using MQTT protocol in Energia IDE to transmit digital values of ECG signal to IBM Watson cloud platform. In MQTT protocol, a particular network service set identifier (SSID) and password is defined along with the baud rate and IBM IoT foundation link is activated. Attempt of network connection generates the Media Access Control (MAC) address and device identification (ID). If the network is connected, a Quick start link is obtained along with the generated device ID.

CHARACTERISTIC WITHDRAWAL

BioSPPy is a toolbox for biomedical signal processing and it is written in Python. ECG signal in BioVid heat pain database is processed and R-peak detection is done using signals.ecg module from BioSPPy library. RRI is nothing but the time interval between two successive R-peaks. Using RRI, features are calculated and extracted. In feature extraction method, the features extracted are as follows.

Mean of RRI: The ratio between the sum of RRI and the number of elements of RRI.

RMSSD: The square root of the mean of the squares of the successive differences between adjacent NNs.

SDNN: It is a measure of changes in heart rate due to cycles longer than 5 minutes.

Ratio SR: It is the ratio between SDNN and RMSSD.

Slope of linear regression of Index of Biotic Integrity (IBI): It is the slope of regression which is used to test the significance of a linear relationship between range of length of RRI and RRI.

All the above set of features was calculated using the appropriate equations given in Table 1. The algorithm for the extraction of features such as RMSSD, SDNN, Mean RR, Ratio SR and Slope is developed as follows.

- Import Pandas, Neurokit and Numpy libraries
- Load ECG signal data from Comma-Separated Values (CSV) file using the pandas read function
- ECG signal is processed and R-peaks are detected using BioSPPy toolbox in Neurokit
- RRI is calculated in array format from the time interval between two successive R-peaks using Numpy library
- Features such as RMSSD, SDNN, Mean RR, Ratio SR and Slope are calculated using standard equation along with the parameters: RRI and range of length of RRI

Table 1: Features with its Corresponding Equation

Features	Equation
Mean	$\frac{\sum_{i=1}^{n} RRI}{n}$
SDNN	$\sqrt{\frac{1}{N-1}}$ x $\sqrt{\sum_{i=1}^{n}(RRI_i - (RRI))^2}$
RMSSD	$\sqrt{\frac{1}{N-1}}$ x $\sqrt{\sum_{i=1}^{n-1}((RRI)_{i+1} - (RRI)_i)^2}$
Ratio SR	$\frac{SDNN}{RMSSD}$
Slope	$\frac{n\,X\,\left(\left(\sum_{j=1} len(RRI)\right)X\left(\sum_{i=1}^{n} RRI_i\right)\right) - \left(\left(\sum_{j=1} len(RRI)\right)X\left(\sum_{i=1}^{n} RRI_i\right)\right)}{nX\left(\sum_{j=1} len\,(RRI)^2\right) - \left(\sum_{j=1} len(RRI)\right)^2}$

RESULTS AND DISCUSSION

Data Acquisition and Transmission: In wireless ECG monitoring system, AD8232 signal conditioning module is interfaced with CC3200 IoT kit using the designed voltage divider circuit to acquire ECG signal. The digital values are displayed in serial monitor of Energia IDE tool. The MQTT protocol is used for the transmission of digital values of ECG signal from the serial monitor to cloud server. The Hypertext Transfer Protocol (HTTP) comment which is viewed in serial monitor is copied to the web and by accepting terms and condition of the IBM Watson cloud platform the digital values are plotted in the dashboard. The transmitted ECG signal using MQTT protocol and TI CC3200 IoT kit is plotted in the dashboard of IoT Platform. Since, the CC3200 IoT Kit uses the 12-bit resolution ADC that returns 12-bits of data per sample. The acquired ECG signal is plotted as time versus ADC values. The P-wave in the electrocardiogram indicates the depolarization of the atria, the QRS complex represent the depolarization process of the ventricles and T-wave represent ventricular repolarization. The RRI is the one in which the interval form the peak of one QRS complex to the peak of next QRS complex is measured and from the values of RRI, a person's heart rate can be classified as normal and abnormal.

Characteristic Withdrawal

ECG signal is plotted for BL1 called no pain

condition as shown in Figure 1. Similarly, ECG signal is plotted for pain conditions. R-peaks are detected using BioSPPy toolbox which is written in Python and RRI is calculated and plotted using the R-peaks. For a single database, the simulation of the developed algorithm calculates RRI values for five different conditions from the R-peaks that have been detected using BioSPPy toolbox and plotted in Figure 2 to Figure 6 respectively. Similarly, RRI values are calculated from the successive differences in time interval between R-peaks from 50 databases and it is plotted. The developed algorithm is simulated using Spyder 3.2.5 to extract features such as RMSSD, SDNN, Mean RR, Ratio SR and Slope RR using the calculated RRI values for five different conditions and the observed values are given in Table 2. Similarly, features are extracted from 50 databases that can be further used for classification of ECG signals to predict arrhythmia.

Table 2: Characteristic Withdrawal

ID	SDNN	RMSSD	MEAN RR	RATIO SR	SLOPE RR
BL1	65.42	80.64	711	0.811	-0.096
PA1	37.35	34.78	706	1.076	-0.102
PA2	37.38	42.95	711	0.871	-0.251
PA3	32.28	28.53	696	1.131	-0.227
PA4	42.79	41.32	684	1.036	-0.381

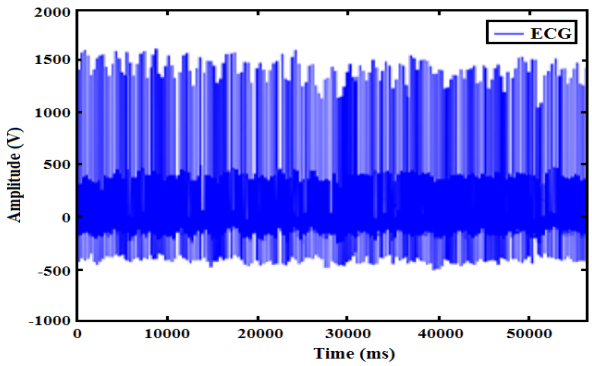

Figure 1 ECG Signal Plot for BL1

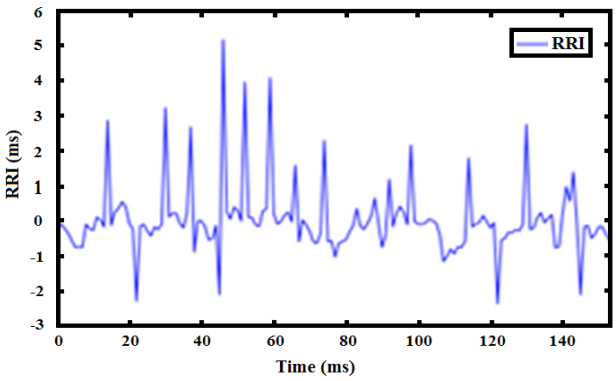

Figure 2 RRI Plot for BL1

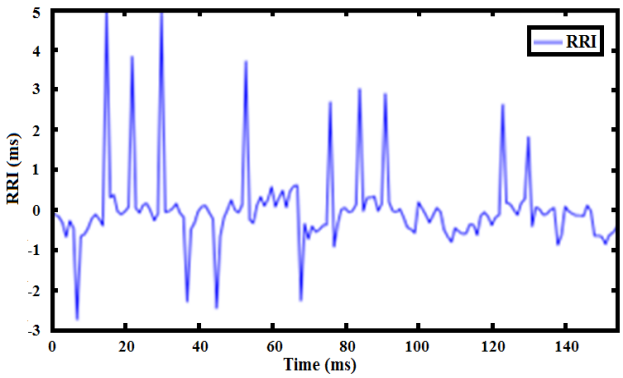

Figure 3 RRI Plot for PA1

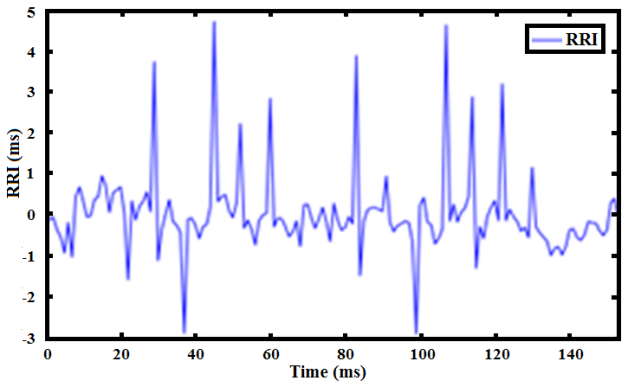

Figure 4 RRI Plot for PA2

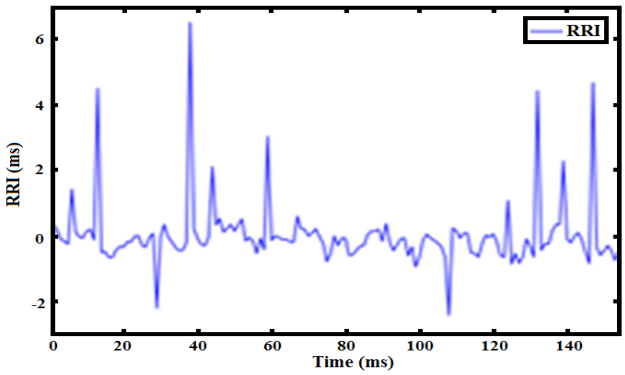

Figure 5 RRI Plot for PA3

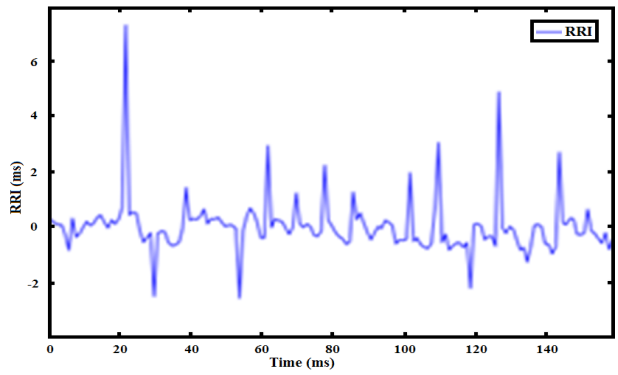

Figure 6 RRI Plot for PA4

CONCLUSION

The objective of implementing wireless ECG monitoring system by means of AD8232 signal conditioning module for real time signal acquisition was done. From the results the following conclusions were made.

The ECG monitoring system with CC3200 IoT kit for analog to digital conversion and Wi-Fi module of IoT kit for transmission of ECG signal to IBM Watson cloud platform was done.

This portable and reliable system helps the physician to give immediate medical care irrespective of patient's location.

R-peaks were detected using BioSPPy toolbox and features such as RMSSD, SDNN, Mean RR, Ratio SR and slope of linear regression of IBI were extracted from 50 databases using the developed algorithm.

Also, R-peak detection using BioSPPy toolbox and feature extraction algorithm can be further applied on the real time acquired ECG signal to extract the features.

Ethical Clearance: Taken from the advisory committee of ACS Medical College and Hospital, Chennai, India.

Source of Funding : Self

Conflict of Interest : Nil

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Assessment of Edentulousness Status, Prosthetic Status and Prosthetic Treatment Needs of Geriatric Population of Belgaum District, Karnataka State

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ABSTRACT

Background and Objectives : Belgaum district in Karnataka state has a large geriatric population residing in the rural and urban areas of its 10 talukas. A study was planned to assess the edentulousness status, prosthetic status and prosthetic treatment needs by location and to compare them with the sociodemographic variables among the residents as per the Census age data of Karnataka State.

Methodology : A descriptive cross sectional study was conducted in Belgaum district among 1700 adult residents aged 60 years and above representing 0.5% of the total geriatric population. A multi stage sampling methodology was used for the selection of the resident, involving a house to house survey. The prosthetic status and prosthetic treatment needs part of the WHO Oral Health assessment form 1997 was included in the self designed proforma. Data was entered using Microsoft excel Software application and results were subjected to statistical analysis by using SPSS package (Chicago, Version 10.5)

Results : The percentage of complete edentulousness in one or both arches was 492 (29%) and the percentage of partial edentulousness in one or both arches was 1074 (63.17%). Only 116 (6,8%) had a full removable denture in one or both arches and 84 (4.94%) of them had partial dentures in one or both arches. Overall, 1435 (84.4%) of the residents had a need for some prosthetic treatment. Edentulousness status, prosthetic status and prosthetic treatment needs were influenced by the sociodemographic variables.

Interpretation and Conclusion : Edentulousness status was high among the geriatric residents. Prosthetic status was low and prosthetic treatment needs were high. Overall, the needs for prosthodontics services were high in the elderly residents of Belgaum District, and a comprehensive strategy needs to be evolved and implemented to address this.

Keywords*: Edentulousness, Prosthetic status, Prosthetic treatment need, Geriatric population, Sociodemographic variables, Belgaum district.*

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INTRODUCTION

Ageing can best be viewed as a biopsychosocial process in which changes occur at various levels in all three components of the biopsychosocial system[1] . Loss of teeth and edentulousness is a significant public health focus area, in the Indian scenario.

The ability to consume the food of one's liking is vital to the psychological health of an individual. It provides a recurring pleasant and satisfying experience that older individuals can anticipate daily. Denial of this simple source of satisfaction and deprivation can lead to depression [2]. 77 million people in India, i.e., 7.7 % of the total population are over the age of 60 years[3]. The present geriatric population is expected to rise to 21 % by 2050.[4]

Studies that have been conducted revealed that the dental and oral health of the elderly subjects was very poor. Data on geriatric oral health in India is scant. Studies conducted by the All India Institute of Medical Sciences (AIIMS), New Delhi found that 60% were dissatisfied with their function of mastication, because of loss of teeth and lack of dentures.[5]

Belgaum district is the second most populated district of Karnataka State, next only to Bangalore district[6]. Belgaum district has a large geriatric population of 3,37,831 as per census records [7,8].

The estimation of treatment need is an important stage in oral health care planning [9]. No reliable literature is available for the present population under study and more work in this field is required for the collection of uptodate information. Hence this study was attempted in the district of Belgaum.

OBJECTIVES

Objectives:

1. To assess the status of edentulousness of the geriatric population by location in Belgaum district.

2. To assess the Prosthetic status and Prosthetic Treatment Needs of the geriatric population by location in Belgaum district.

3. To compare by area, the edentulousness status, Prosthetic status and Prosthetic Treatment Needs with respect to the socio demographic variables of the geriatric population by location in Belgaum district.

Methodology:

1. Type of study: This study was a Descriptive Cross sectional study conducted among the geriatric population of Belgaum district, Karnataka state.

2. Details of study subjects:

a.) Area and Population under study: Belgaum is a large district in the state of Karnataka, and comprises of [10] talukas namely Athani, Bailhongal, Belgaum , Chikkodi, Gokak, Hukkeri, Khanapur, Raibag,Ramadurg, and Saundatti.

b.) It has a total geriatric population of 3,37,831 after taking into consideration the population growth factor per year10. The geriatric population residing in both rural and urban areas was the population under study.

This study was conducted in 50 areas of the 10 talukas, of Belgaum district.

0.5% of the population, 1689 was taken as the final total sample size, and finally approximated to 1700.

3. Method of Data collection:

(i) Patient selection criteria :

(a) Inclusion criteria:

- Subjects both male and female over the age of 60 years

- Subjects who were willing to participate in the study and who provided informed consent

- Teeth that were not salvageable and indicated for extraction due to Dental Caries or Periodontal Diseases or any other factor were considered as missing teeth and included for the Prosthetic Treatment Needs.

(b.) Exclusion criteria :

- Third molars and supernumerary teeth were not included in the study

- Patients who were not able to open their mouth or patients with neurological impairment and debilitating illness were not included in the study.

(ii.) Sample Size:

1700 elderly residents of age 60 years and above were interviewed and examined. This sample

(1689) represents 0.5% of the geriatric population of Belgaum district.

(iii.) Sample Design :

A Multi Stage Sampling Design 11 was used

In the First stage,

The District Map was studied and by giving due representation to all the

10 talukas of the District, all 10 talukas were selected.

In the Second Stage,

From each Taluka, 4 rural areas and 1 Urban area was selected by Simple Random Sampling Method.

In the Third stage, from each selected area ,

For the Urban area, 3 wards were selected

For the Rural area , 3 wards were selected

In the Fourth Stage,

From each ward, 2 to 3 lanes / bylanes / blocks were selected by the Lottery method.

In the Fifth stage,

From the 2 to 3 lanes / bylanes / blocks so selected, a house to house survey was conducted.

Permission for the study was taken from the Institution Ethical Committee and the offices of the Tahsildar and Grama Panchayath.

Procedure :

(a) Written informed consent was obtained from all the subjects before examination with a witness to the administration.

(b) A house to house survey was conducted.

(c) A self designed Proforma which is a modification of the WHO Health Assessment form 1997 11 was used to record the data. Subjects wearing a prosthesis , but requiring a new prosthesis were included under both Prosthetic Status and Prosthetic Treatment Needs

(d) Around 25-30 subjects were examined per day[12].

Procedure used for data collection :

Method: A single examiner interviewed and examined all the 1700 geriatric residents periodically. A Dental Intern was trained in recording the findings. The Proforma was pre tested to eliminate confusion while recording.

Pilot study: Before the actual survey was conducted, a pilot study was conducted on 50 geriatric residents to familiarize oneself and the recording assistant with the method of examination and its subsequent recording and this study was excluded from the main study.

Procedure: The main survey was conducted with this Pre tested Proforma. 3 wards were selected from the information available at every town panchayath or grama panchayath.

From thereon, a house to house survey was conducted along with a worker of the Panchayath office. Each proforma had 34 items to be filled in. The options were coded in numerals to enable easy entry. For the purpose of infection control, disposable materials were used wherever applicable and appropriate sterilization method was followed. The examination was followed by health education and subsidized treatment options.

Statistical Methods :

All the data so obtained was entered in Windows – XP Microsoft Excel Sheet .The Mean, SD, Percentages were calculated. The following tests were employed for analysis

- Chi Square test
- T test
- Anova (Analysis of Variance)

Level of significance was considered at $p < 0.05$.

Method of Statistical Analysis:

The following methods of statistical analysis have been used in this study. The Excel and SPSS (SPSS Inc, Chicago) statistical software packages were used for data entry and analysis.

The results were presented in numbers and percentage for categorical data in Tables.

1) Proportions were compared using Chi-square test of significance

Chi-Square ($\chi 2$) test for (r x c tables)

Rows	Columns			Total
	1	2……..	c	
1	a_1	a_2	a_c	t_1
2	b_1	b_2	b_c	t_2
.	.	……	.	.
.	.	……..	.	.
r	h_1	h_2	h_c	t_r
Total	$\mathbf{n_1}$	$\mathbf{n_2}$	$\mathbf{n_c}$	**N**

a,b…..h are the observed numbers.

N is the Grand Total

$$\chi^2 = N\left[\frac{1}{t_1}\sum_1^c \frac{a_1^2}{n_i} + \frac{1}{t_2}\sum_1^c \frac{b_1^2}{n_i} + \ldots\ldots\ldots\ldots + \frac{1}{t_r}\sum_1^c \frac{h_1^2}{n_i} - 1\right]$$

DF=(r-1)*(c-1), where r=rows and c=columns

DF= Degrees of Freedom (Number of observation that are free to vary after certain

Restriction have been placed on the data)

In the above test a "p" value of less than 0.05 was accepted as indicating statistical significance.

RESULTS

The Socio demographic profile of the population and the study findings are as below. The key findings are depicted in the Tables 1, 2, 3, 4, 5, 6.

- The majority of the residents are in the 60-69 (young old) age group, were males, were married, and were vegetarians.
- The majority of them are illiterate and are in social class V (i.e. below Rs. 391), are farmers by occupation followed by agricultural laborers.
- The majority of them do not have deleterious habits followed by those who have the habit of using tobacco.
- The majority of them are using only their fingers for cleaning their teeth and are cleaning their teeth only once a day.
- The main reason for missing teeth is dental caries followed by periodontal diseases.
- The mean duration of edentulousness is more in the lower arch than in the upper arch and the mean duration of edentulousness is more in the rural areas than in the urban areas.
- The mean number of teeth present is more in the urban areas than in the rural areas and the mean number of missing teeth is more in the rural areas than in the urban areas.
- There is a relationship seen between edentulousness status and age, gender, location, diet, education, occupation and per capita income.
- Majority of the rural and urban elderly had partial edentulousness in one or both arches.
- There is a relationship seen between prosthetic status and age, gender, location, education, occupation and per capita income. Majority of the rural and urban elderly had no prosthesis, in one or both arches and when there is a prosthesis, the majority of it is a full removable denture in one or both arches.
- There is a relationship seen between prosthetic need and age, gender, location, education, occupation and per capita income. Among the rural elderly, majority of them had a need for multi unit prosthesis in one or both arches, whereas among the urban elderly, a majority of them had a need for a combination of one and / or a multi unit prosthesis, in one or both arches.

(Ref : Image Files : Tables 1, 2,3,4,5,6)

Table 1 – Edentulousness status of Upper Arch according to area and gender

Area	Sex	Edentulousness status Upper arch			Total
		No	Partial	Complete	
Rural	Male	87	628	259	974
		8.9%	64.5%	26.6%	100.0%
	Female	43	244	99	386
		11.1%	63.2%	25.6%	100.0%
Urban	Male	21	151	76	248
		8.5%	60.9%	30.6%	100.0%
	Female	10	51	31	92
		10.9%	55.4%	33.7%	100.0%

Cont... **Table 1 – Edentulousness status of Upper Arch according to area and gender**

Area	Chi-Square Value	df	'p' value	NS, S,HS
Rural	1.572	2	.456	NS
Urban	.959	2	.619	NS

Table 2 – Edentulousness status of Lower arch according to area and gender.

Area	Sex	Edentulousness status Lower arch			Total
		No	Partial	Complete	
Rural	Male	95	616	263	974
		9.8%	63.2%	27.0%	100.0%
	Female	43	234	109	386
		11.1%	60.6%	28.2%	100.0%
Urban	Male	22	141	85	248
		8.9%	56.9%	34.3%	100.0%
	Female	10	46	36	92
		10.9%	50.0%	39.1%	100.0%

Area	Chi-Square Value	df	'p' value	NS, S ,HS
Rural	.982	2	.612	N.S.
Urban	1.303	2	.521	N.S.

Table 3 – Prosthetic status of upper arch according to area and gender.

Area		Prosthetic Status Upper Arch					Total
		No prosthesis	Bridge (Orange)	Partial denture (Purple)	Both bridge(s) and partial dentures	Full removable denture (Pink)	
Rural	Male	888	2	25	-	59	974
		91.2%	.2%	2.6%	-	6.1%	100.0%
	Female	341	1	19	1	24	386
		88.3%	.3%	4.9%	.3%	6.2%	100.0%
Urban	Male	220	-	2	1	25	248
		88.7%	-	.8%	.4%	10.1%	100.0%
	Female	79	1	3	1	8	92
		85.9%	1.1%	3.3%	1.1%	8.7%	100.0%

Area	Chi-Square Value	df	'p' value	NS, S,HS
Rural	7.557	4	.109	NS
Urban	6.172	4	.187	NS

Table 4 – Prosthetic status of Lower arch according to area and gender.

Area		Prosthetic Status Lower Arch					Total
		No prosthesis	Bridge (Orange)	Partial denture (Purple)	Both bridge(s) and partial dentures	Full removable denture (Pink)	
Rural	Male	896	-	18	1	59	974
		92.0%	-	1.8%	.1%	6.1%	100.0%
	Female	346	-	15	-	25	386
		89.6%	-	3.9%	-	6.5%	100.0%
Urban	Male	221	-	1	1	25	248
		89.1%	-	.4%	.4%	10.1%	100.0%
	Female	82	1	1	-	8	92
		89.1%	1.1%	1.1%	-	8.7%	100.0%

Area	Chi-Square Value	df	'p' value	NS,S,HS
Rural	5.375	3	.146	NS
Urban	3.733	4	.443	NS

Table – 5 : Prosthetic Need of Upper arch according to area and gender.

Area	Sex	Prosthetic Need Upper Arch					Total
		No prosthesis needed	Need for one unit prosthesis (Green)	Need for multiunit prosthesis (Grey)	Need for a combination of one and/ or a multiunit prosthesis	Need for full prosthesis	
Rural	Male	151	31	301	267	224	974
		15.5%	3.2%	30.9%	27.4%	23.0%	100.0%
	Female	68	17	112	100	89	386
		17.6%	4.4%	29.0%	25.9%	23.1%	100.0%
Urban	Male	30	5	71	77	65	248
		12.1%	2.0%	28.6%	31.0%	26.2%	100.0%
	Female	16	-	27	24	25	92
		17.4%	-	29.3%	26.1%	27.2%	100.0%

Area	Chi-Square Value	df	'p' value	NS, S, HS
Rural	2.493	4	.646	NS
Urban	3.837	4	.429	NS

Table - 6 : Prosthetic Need of Lower arch according to area and gender

Area	Sex	Prosthetic Need Lower Arch					Total
		No prosthesis needed	Need for one unit prosthesis (Green)	Need for multiunit prosthesis (Grey)	Need for a combination of one and/ or a multiunit prosthesis	Need for full prosthesis	
Rural	Male	162	35	312	258	207	974
		16.6%	3.6%	32.0%	26.5%	21.3%	100.0%
	Female	70	15	120	94	87	386
		18.1%	3.9%	31.1%	24.4%	22.5%	100.0%
Urban	Male	30	7	59	82	70	248
		12.1%	2.8%	23.8%	33.1%	28.2%	100.0%
	Female	16	1	17	28	30	92
		17.4%	1.1%	18.5%	30.4%	32.6%	100.0%

Area	Chi-Square Value	df	'p' value	NS, S, HS
Rural	1.207	4	.877	NS
Urban	3.678	4	.451	NS

CONCLUSION

Oral health significantly contributes towards overall health and well being of elderly persons [13]. Barriers to oral health care among the elderly are considerable. Impaired mobility, financial hardships, cost of dental treatment, negative attitudes and lack of social support, may deter them from a dental visit.

It is essential that tooth loss be avoided as far as possible. If teeth have to be extracted, or where teeth have already been lost, prosthodontic rehabilitation should be provided to stabilize the arch and to restore function.

The need for prosthodontic services are high in the elderly residents of Belgaum district. To meet the challenges of providing oral health and prosthodontic care to the population under study, a comprehensive strategy needs to be evolved and implemented.

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Customers Perspective on Adaptiveness to Cab Sharing –A Social Innovation

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ABSTRACT

India is a promising market for both domestic and international car manufacturers. The car density is around 20 per 1000 people which may gradually grow up due to the rising urbanization. The rising density may create lots of environmental pollution, traffic jams and parking space concerns and it is necessary for the Government to take necessary action and disruptive thinking towards discouraging car ownership.

Cab sharing is increased in current years and this is more prevalent for commuters who often travel for longer distance or for shopping / work place to save the economy and reduce the cost. Many cities in India face despite having multi-level parking construction in Shopping Malls, IT Parks and other public places is yet to resolve the problem of parking crunch. Cab sharing not only addresses this problem but also reduces fuel consumption. In this study the cab sharing intention factors from the customers perspective is analyzed through literature review and questionnaire. SPSS 21 tool has been used to analyze the association and relationship of factors influencing cab sharing.

Keywords: *Adaptive sharing, carbon footprint, cab sharing*

INTRODUCTION

Cab sharing also known as ride sharing/ carpooling is sharing of car by more than one person and prevents driving on own by the person to the location. Car-sharing is a solution to people who would normally can't afford owning a car or using a private cab/taxi service as the primary mode of transport.

Cab sharing is well-defined as a means of social drive and environmental issues. Sharing a cab is for resident users in support of public transportation and to achieve the goal of the environment to reduce the road emission. According to Transportation Sustainability Research Center at UC Berkley, for every car sharing the number of cars on the road are fewer by 9 to 13 due to selling or postpone of the purchase of car. This reduces the carbon emission by 34-41%. Government should consider their policy while considering the future planning of the city to avoid congestion on the road. The addition of 404 million urban dwellers to the Indian cities was launched by the Government in 2015 in its "Smart Cities Mission" as per the United Nation projects by 2050. This adds the pressure on the Government to provide a sustainable and smart project with a decent life for citizens with environmental friendly. To address this issue an amount of $15 billion USD will be spent with a mission to support 100 cities in a period of five years. Cab sharing will address few of these proposals and will provide a support for this mission.

Usage of Cab Sharing by more than one person reduces the travelling cost by reducing the fuel cost/ consumption and the stress of parking and driving. The concept is more environmental friendly by reducing the pollution, traffic and parking requirement. It also takes care of full capacity seating in the cab.

While cab sharing is mainly considered for smaller distance and short time journeys but rarely on long distances where it connects to overall transportation system, while using it helps the commuters to control the cost compared to individual car cost. Now a day, commuters do not see to social status while car sharing they only want to reduce the cost and to save the economy. So, these typically lead to innovating something differently in benefit for society.

LITERATURE REVIEW

Suresh Malodia & Harish Singla [1] analyses on perception of the people on carpooling and the decision to join cab sharing. The paper analyses on the cognitive attitude in evaluating the perceived notion on the carpooling. The paper also identifies the "time convenience" factor that discourages cab sharing and "Public-private cost" factor encouraging cab sharing.

Mckinsey & company [2] examined about the preferences of consumers whose preference has shifted towards quick modes of transport in the recent years the researcher has found out that being computerized and connectivity where these both plays a major role in the system of car sharing. We can understand that social networking acts as a major drive force for people to car share.

Scott Le Vine, Alireza Zolfaghari, John Polak [3] tries to examine the property across the board (large-scale) sharing a car system which differ from different modes of transport particularly in metropolitan cities some may prefer for public transport and some private transport where the study found out that connectivity and communication is the most important thing in the car sharing system.

Anna Butzin etal [4] identifies sharing as a means of economy allows persons as well as group to construct capital as of below second-hand material goods. In this way, substantial properties are mutual as forces. The study found out that owner of a car might allow somebody to hire out his/her own vehicle (means of transport) if he/ she is not using it, where car sharing plays a major role in it.

Hai An, Lujun Guhas [5] examined from the theoretical data that by using existing review of literature from the previous studies of car sharing and sustainable in it. The author found out from the study that there are two main reasons for developing the car sharing the first one is that lack of enough supportive from administration and the other is insufficient distribution of information related to it.

Christopher Gomez, La petite Reine [6] in their study have discussed about the present happenings in car sharing industry and its booming around the globe. The study has found out that many well-developed countries are now used to car sharing industry and suggest their employees too. This inculcates large number of members growth in car sharing field to save our economy as well as to reduce the cost.

Vorgelegt von [7] has found out from the study that car sharing in recent years are the upcoming challenges for the corporate to overcome it because many employees use their private vehicles to reach their organization. The author has concluded that now a day's many innovative ways of different types of services are provided by the organization for their employees to easily carpool or to benefit their employees for eco-friendly environment.

Agnès Hubert [8] studies about the innovations of car sharing which also leads to lot of interactions with others which creates the employee well- being, where communication plays a major role which helps in connecting to more than one people or individuals to develop the countries environment for creating air free or pollution free economy.

Steven P. Spears [9] has studied about car sharing which helps individuals to reduce the cost rather than travelling in a private car in simple it is been said as cost savings which leads to saving in environment, decides markets potential the author found out from the study that many divers change themselves to other modes of transport which would leads others to also switch over to high fluctuation in cost, high parking price etc.

Daniel Sperling and Susan Shaheen [10] tries to examine sharing a car is easy and simple many household people and business persons access now a day to shared vehicle to reduce the cost and save the environment from the study the researcher found out that individual achieve the advantages of using personal cars with no overheads expense and possession of tasks from these the society gain benefits related to (PEST) political, economical, social, technological.

METHOD

The research paper takes empirical study to find out the cab sharing intention factors from the customers perspective to analyze the cognitive attitude of the respondents in using the cab sharing. Literature Review has been done to analyze the factors influencing the cab sharing intention. Data has been collected through convenient sampling from 131 respondents in Chennai. Primary data has been collected by distributing the questionnaire among customers to get the opinion on

car sharing. By the reliability test (Cronbach's alpha) is (0.887) tested and the instrument used for analysis is found to be reliable. SPSS 21 is used for the analysis. The tools used for the analysis were Karl Pearson's Correlation, One Way Anova & Regression analysis. The following hypothesis has been tested:

Hypothesis 1:

$H0_1$: There exists no significant difference between age and the cab sharing intention

Hypothesis 2:

$H0_2$: There exists no significant difference between the occupation and the cab sharing intention

Hypothesis 3:

$H0_3$: There exists no association between ease of use, environment, economical and safety factors

Hypothesis 4

$H0_4$: There exists no significant influence of Ease of use and safety on the cab sharing intention.

RESULTS & DISCUSSION

I: Difference between age groups and cab sharing intention

Table 1:

ANOVA-age and intention					
	Sum of Squares	**Df**	**Mean Square**	**F**	**Sig.**
Between Groups	135.182	3	45.061	7.017	.000
Within Groups	815.505	127	6.421		
Total	**950.687**	**130**			

One-way Anova was used to find if there exists any significant difference among the age groups, 15-25,25-35,35-45 and above 45. The research finding shows that there exists a significant difference between age groups-and cab sharing intention as F=7.017 and p<0.01. Hence the null hypothesis is rejected. Moreover, it also states that the age differences have some effect on the cab sharing intention.

II: Association between the type of occupation and cab sharing intention

Table 2:

ANOVA-occupation and intention					
	Sum of Squares	**Df**	**Mean Square**	**F**	**Sig.**
Between Groups	228.408	4	57.102	9.961	.000
Within Groups	722.279	126	5.732		
Total	950.687	130			

The research finding shows that F=9.961 and p<0.01 which states that there exists a significant difference among the occupation such as professional, private, business, homemaker, student. Hence the alternate hypothesis is accepted.

III: Association between the Factors (Ease of use, Environmental, Economic, Safety) and Cab sharing intention.

Table 3:

Correlations						
		Ease of use	**Environmental**	**Economic**	**Safety**	**Intention**
Ease of use	Pearson Correlation	1	.515**	.658**	.623**	.542**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	131	131	131	131	131
Environmental	Pearson Correlation	.515**	1	.602**	.450**	.329**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	131	131	131	131	131

Cont... **Table 3**:

Economic	Pearson Correlation	.658**	.602**	1	.449**	.352**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	131	131	131	131	131
Safety	Pearson Correlation	.623**	.450**	.449**	1	.494**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	131	131	131	131	131
Intention	Pearson Correlation	.542**	.329**	.352**	.494**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	131	131	131	131	131
**. Correlation is significant at the 0.01 level (2-tailed).						

Pearson correlation test is used to find the association between the factors such as Ease of use, Environmental, Economic, Safety and Cab sharing intention. The analysis results as summarized in the table 1 suggests that there is a significant association between the factors and cab sharing intention at 0.01 level. There is a strong positive correlation between Ease of use and Economic factors with 42% significance, environmental factor and economic factor with 36% significance, safety and ease of use with 38% significance. All the factors associate with cab sharing intention as well. Hence the null hypothesis is rejected. It also states the importance of the above factors with respect to cab sharing.

IV: Relationship between Ease of use and Safety factors influencing cab sharing intention

Table 4:

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.578[a]	.334	.323	2.22486
a. Predictors: (Constant), safety, Ease of use				

Table 5:

ANOVA[a] - **Regression** :Variance explained by Independent Variables Safety and Ease of Use, **Residual**: Variance Not explained by independent Variables

Total: Sum of the Regression and Residual

Model		**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**
1	Regression	317.090	2	158.545	32.029	.000[b]
	Residual	633.597	128	4.950		
	Total	950.687	130			
a. Dependent Variable: intention						
b. Predictors: (Constant), safety, Ease of use						

The significant value is less than .01(Table 5), which means that the dependent variable intention is significantly predicted by independent variables safety and ease of use at 99% confidence level.

Table 6:

Multiple Regression – Ease of Use, Safety and Intention Coefficients						
Model B		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		Std. Error	Beta			
1	(Constant)	4.275	.780		5.480	.000
	Ease of use(X1)	.329	.079	.382	4.139	.000
	Safety(X2)	.311	.112	.257	2.783	.004
a. Dependent Variable: intention						

Regression analysis is done to prove the above hypothesis. Y=4.275+0.329X1+0.311X2, where 0.329 is the partial regression coefficient of X1 and 0.311 is the partial regression coefficient of X2. The above regression equation states that for each unit increase in the ease of use factor the cab sharing intention is increased by 0.329 and for each unit increase in the safety factor the cab sharing intention is increased by 0.311. R-squared value is bound to be lower in studies that explain the human behavior as stated by Jim Frost (2017). Also, the R square and the significance of F statistic explain that the model provides a good fit. Hence, the Null Hypothesis is rejected. This proves that there exists a significant influence of ease of use and safety on cab sharing intention.V: Weightage of statements.

Table 7:

Factors	**Mean**
Cab sharing reduces travelling cost	4.31
Cab sharing eliminates parking charges	4.14
Cab sharing reduces pollution	4.11
Cab sharing eliminates parking problems	3.89

The above given factors are the most agreeable factors according to the opinion of the respondents. The reduction of travelling cost, elimination of parking charges, reduction of pollution, elimination of parking problems are commonly agreeable factors. This would highlight that the respondents agree on all these four factors, which can be given priority by companies while designing marketing plan for cab sharing.

CONCLUSION

Cab sharing is essential for Indian cities with booming traffic problems and concern over environmental pollution. Its success rate may not be high in all the places at all the period unless there is discouraging parking costs, higher traffic concerns and when alternate modes of transport are available. It is clear from the study that people have shown their intention for cab sharing with respect to ease of use and safety. Also, the intention differs about age and occupation. However, cab sharing business can concentrate more on the convenience factors like on time availability of service, pick up & drop place and travel time consumption for the customers. Despite of development of alternate sources of transport systems like Metro Services still the future of cab sharing market can be made growing by creating more awareness and promotions on its advantage over environmental friendly, parking concerns and cost effectiveness to the people by the cab sharing organizations and by Government through its policy. Environmental consciousness is the need of the hour with higher co2 emissions rates. In one of the pollution control method cab sharing can be the apt solution for the society which takes care of both social and individual intention. In todays' world of disruptive business environment we need businesses to have people with skills for identifying more problems than skills for finding more solutions to sustain in the market.

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Ethical Clearance : Nil

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Risk Factors for Stunting among Children Aged 0 – 23 Months in Kalimantan Selatan Province

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ABSTRACT

The result of nutritional status monitoring in Kalimantan Selatan Province 2016, stunting prevalence of children aged 0-23 months is 25.6% and becomes a public health problem (≥ 20%). The study were to analyze the risk factors related to the stunting of the child's age, sex, maternal education, father's education, mother's job, father's job, number of household members, initiation of early breastfeeding, exclusive breastfeeding, prelakteal and high- mother. The study used secondary data from nutritional status monitoring of Kalimantan Selatan Province in 2016 based on cross-sectional design . The population is children aged 0-23 months. Determination of the sample using systematic random sampling with the number of 266 children. Data were analyzed using Chi-Square test and multiple logistic regression test. The children aged 0-23 months who had stunting amounted to 25.9%. Chi-Square test showed three variables have significant relationship with stunting that is children aged under two-years, father education and mother height . Multiple logistic regression test showed that the most dominant factor was related to the stunting is father education. It is necessary improvement of father education through "Kejar Paket B/C Program".

***Keywords**: Risk factors, stunting, children aged 0-23 months.*

INTRODUCTION

The result of nutritional status monitoring in Kalimantan Selatan Province 2016, stunting prevalence of children aged 0-23 months is 25.6%. The prevalence of stunting in Kalimantan Selatan Province is a public health problem because of its prevalence of 20% or more.[1] The basic of health research data in 2013 shows that stunting prevalence of toddlers in Kalimantan Selatan increase significantly in the children aged 0 – 23 months.[2] In nutritional status monitoring result, the prevalence of stunting in a boy is 16.9% greater than a girl of 14.3%.[1] The average number of household members consists of 4 persons.[3] The average of this province is only completing the level of education up to grade 1 junior high school.[4] The Center of Statistic Council recorded 67.67% of the population of this province with employment status. The employed female population of 54.02% and unemployed of 45.98% while the employed male population of 81.05% and unemployed of 18.95%.[5]

Data in Kalimantan Selatan Province showed children under 6 months given exclusive breastfeeding in 2016 of only 30.95% and newborns received early breastfeeding initiation ≥ 1 hour still at 10.09 %, still below the target of 50%,[6,7] whereas the percentage of children aged 0-23 months who were given prelakteal food reached 54.7%.[2] Prevalence of stunting in adults reached 51.9%. The basic of health research data in 2010 shows that short-term mothers tend to give birth to larger stunting children (47.2%) than the normal mother's group (36.0%).[8] The purpose of this study is to analyze the risk factors associated with stunting in children aged 0-23 months in Kalimantan Selatan Province.

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MATERIALS AND METHOD

The research design is cross-sectional using secondary data derived from the nutritional status monitoring survey of Kalimantan Selatan Province in 2016. This research covers the districts in Kalimantan Selatan on November and December 2017. The population is all children of children under two years aged 0 – 23 months contained in the nutritional status monitoring data of Kalimantan Selatan Province in 2016 as many as 1949 people. A total of 266 samples were selected using a systematic random sampling technique. Data collection by copying data from nutritional status monitoring database in Kalimantan Selatan Provincial Health Office using portable data storage media (flash disk) and computer devices. Secondary data obtained in the electronic file form nutritional status monitoring survey in 2016. Data analysis includes frequency distribution, chi-square test, and Odds Ratio as well as multiple logistic regression.

RESULTS AND DISCUSSION

Table 1. The Relationship of Variables to Stunting Prevalence

Variables	Stunting Prevalence						p-value	OR	95% CI
	Stunting		Normal		Total				
	n	%	n	%	n	%			
Age									
12-23 months	42	31.8	90	68.2	132	100.0	0.042*	1.849	1.058-3.234
0-11 months	27	20.1	107	79.9	134	100.0			
Gender									
Male	36	24.3	112	75.7	148	100.0	0.594	0.828	0.478-1.435
Female	33	28.0	85	72.0	118	100.0			
Mother education									
Low	52	28.9	128	71.1	180	100.0	0.150	1.649	0.886-3.068
High	17	19.8	69	80.2	86	100.0			
Father education									
Low	55	32.2	116	67.8	171	100.0	0.003*	2.743	1.430-5.264
High	14	14.7	81	85.3	95	100.0			
Mother job									
Employed	9	16.7	45	83.3	54	100.0	0.117	0.507	0.233-1.100
Unemployed	60	28.3	152	71.7	212	100.0			
Father job									
Employed	1	33.3	2	66.7	3	100.0	1.000	1.434	0.128-16.065
Unemployed	68	25.9	195	74.1	263	100.0			
Household members									
Bags	16	29.1	39	70.9	55	100.0	0.670	1.223	0.632-2.366
Enough	53	25.1	158	74.9	211	100.0			
Early breastfeeding initiation									
None and < 1 hour	60	25.2	178	74.8	238	100.0	0.573	0.712	0.306-1.657
≥ 1 hour	9	32.1	19	67.9	28	100.0			
Exclusive breastfeeding									
None	43	27.4	114	72.6	157	100.0	0.614	1.204	0.686-2.115
Yes	26	23.9	83	76.1	109	100.0			
Prelakteal Food									
Yes	24	24.5	74	75.5	98	100.0	0.789	0.886	0.500-1.573
None	45	26.8	123	73.2	168	100.0			
Mother height									
Low (< 150 cm)	37	33.9	72	66.1	109	100.0	0.019*	2.007	1.152-3.497
Normal (≥ 150 cm)	32	20.4	125	79.6	157	100.0			

Table 2. Multiple Logistic Regression Analysis

No	Variables	p value	OR	CI 95%
1	Father's education	0.004	3.356	1.463-7.696
2	Mother's height	0.054	1.772	0.990-3.172
3	Children age	0.008	2.208	1.227-3.973
4	Mother's education	0.475	0.747	0.336-1.662

There is a relationship between the child›s age and stunting with the OR value of 1.849 which means children aged 12-23 months have a risk of 1,849 times to stunting compared with children aged 0-11 months. This is because the higher the age of the child will increase the need for nutrients needed for burning energy in the body. The required nutritional intake for children aged 12-23 months increases.[9]

There is no relationship between gender and stunting. This is because in the growing period, basically boys and girls aged 0-23 months have relatively equal growth in terms of body length. Children aged 0-23 months experiencing physical growth is increasing the size of anthropometry. The physical growth of the child is not distinguished by sex.[10]

There is no relationship between mother's education and stunting since most mothers (67.7%) had low education levels and father education as the dominant factor associated with stunting. The role of father as a leader in the household has greater authority than mothers in family-related decision making in the field of health and nutrition. The role of the mother in the family is to apply the decisions that have been made by the father. In addition, unrelated mother education is suspected due to cultural factors such as the existence of certain types of dietary restrictions. Cultural factors play a role in the process of eating habits that can cause nutritional problems if the food factor is not properly considered.[11]

There is a significant relationship between father education and stunting with OR value of 2.743 means that children who have a father with low education have a risk of 2.743 times to the stunting compared with children who have a father with higher education. Fathers who have a higher education will be oriented to preventive measures, know more about health problems and have better health status. The level of education also determines whether or not a person can absorb and understand nutrition and health knowledge. This is closely related to the knowledge insight into the source of nutrition and the type of food that is good for family consumption.[12]

There is no relationship between mother job and stunting because most mothers (79.7%) are unemployed and the father's role is greater in affecting family income because most fathers work (98.9%). The type of father job is mostly 33.5% as an entrepreneur. Adequate income from the work of the father will support growth and development children because the father can meet all the needs of primary and secondary children.

There is no relationship between father's job and stunting because a father is positioned as the breadwinner. It can be seen in the results of this study that most (98.9%) fathers work while providing the nurturing food is the dominant role of mother.[13]

There is no relationship between the number of household members and stunting because most of the respondents (79.3%) had a sufficient number of household members (≤ 4 persons). A total of 39.8% had 4 household members and a small number (0.4%) had 11 household members. In addition, most fathers work with an adequate kind of father's job, entrepreneurs.

There is no relationship between the early breastfeeding initiation and stunting because most of the mothers (89.5%) did not or only ≤ 1 hour early breastfeeding initiation while 10.5% of women did early breastfeeding initiation ≥ 1 hour. There is a significant relationship between exclusive breastfeeding with stunting because most of the mothers (59.0%) did not breastfeed exclusively. Incorrect breastfeeding supplements that are not appropriate to the nutritional needs of children can lead to malnourished children. Most mothers (26.3%) give formula-fed children that require dilution with a certain concentration or concentration (according to the baby's ability to absorb). If dilution is

too fluid, it can cause the baby to malnutrition.

There is no relationship between feeding prelakteal and stunting because most of the mothers (63.2%) did not provide food prelakteal and most of the mothers (89.5%) did not perform or only <1-hour initiate breastfeeding early. The most prevalent prelakteal food in this research is formula feeding as much as 26,3%.

There is a relationship between mother's height and stunting with OR value of 2.007 means that mother with short category height has 2.007 times risk having a child aged 0-23 months of stunting compared with mothers with normal category height. The relationship between mother's height and infant health can be seen from two factors namely heredity and mother's health factor. One or both short-term parenting due to pathological conditions (such as growth hormone deficiency) has a gene in chromosomes that carry short traits. These conditions increase the chances of children inheriting the gene and grow into stunting children.[14] The gene that affects height is HMGA2 gene[15] on chromosome 12 and[16] LIN28B gene[17] on chromosome 6.[18] However, if the parent is short due to nutritional deficiencies or illness, the child may grow at normal height as long as the child is not exposed to other risk factors. Short women have narrower hip bones. In short pregnant women, obstructed blood flow in the womb due to the condition so that growth of the uterus, placenta, and the fetus is inhibited.[14] Base on the multiple logistic regression analysis, the most dominant variable related to stunting incidence is father education.

CONCLUSION

Risk factors associated with stunting is the age of children under two-years, father's education, mother's height with the dominant factor of father's education. It needs to be an improvement of father's education through Kejar Paket B/C program, a nonformal educational for them who don't get any education of senior high school.

Ethical Clearance

This study approved and received ethical clearance from the Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia. In this study, we followed the guidelines from the Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia for ethical clearance and informed consent. The informed consent included the research tittle, purpose, participants' right, confidentiality, and signature.

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Conflict of Interest: The authors declare that they have no conflict interests.

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Clinicohaematological Study of Pancytopenia in a Tertiary Care Centre – One Year Experience

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ABSTRACT

Background: Pancytopenia is reduction in all three lineages of haematopoietic cells. The etiology varies widely in patients; ranging from transient marrow suppression as in viral fever to a manifestation of underlying serious or life threatening disease as leukaemia. Knowing the exact etiology is important for specific treatment and prognostication.

Aims & Objectives: To evaluate the etiological and clinico-hematological profile in patients of pancytopenia in our tertiary care hospital of North India.

Material & Method: This is a cross-sectional comparative prospective study conducted over a period of one year (June 2014 to June 2015) in the department of Pathology, SMS&R Greater Noida. The detailed clinical history, physical examination and hematological parameters including bone marrow aspirate and biopsy of pancytopenic patients at presentation were recorded. In 51 cases of pancytopenia bone marrow aspirate and in 9 cases bone marrow biopsies were done.

Results: There were 74 cases of pancytopenia. The most common cause in our study was megaloblastic anaemia (30 cases) followed by mixed nutritional anaemia (14 cases). The other causes in descending order of occurrence were iron deficiency anemia (4 cases), dengue infection (4 cases), multiple myeloma and metastatic carcinoma (2 cases each). The less common causes include tropical splenomegaly, myelodysplastic syndrome, non Hodgkin lymphoma, aleukemic leukaemia, hemophagocytosis, leishmaniasis and ITP with one case of each.

Conclusion: Pancytopenia is one of the most common hematological problem encountered in routine clinical practice. A proper work up with routine clinical information,routine hematological parameter bone marrow study and other relevant studies and thus help in early diagnosis and proper management.

Keywords: *pancytopenia; etiology, trephine biopsy, megaloblastic anemia*

INTRODUCTION

Pancytopenia is an important clinico-hematological entity commonly encountered in clinical practice. [1]The clinical pattern varies and thus the treatment modalities and outcome.[2] Pancytopenia is defined as a combination of anemia, leucopenia and thrombocytopenia with hemoglobin < 9 gm./dL, total leucocyte count < 4x 10^9/L and platelet count < 140 x 10^9/L . [3] It is not a disease entity per se but a triad of findings that may be manifestation of many serious and life threatening diseases.[4, 5] Few studies have analyzed adult patients with pancytopenia but still there is scarcity of data. The present study was undertaken to study clinical presentations in pancytopenic patients in wider age group (2-70years) attending the OPD's of the tertiary care hospital of SMS&R, Greater Noida. We also evaluated hematological parameters including bone marrow aspiration and biopsy. This study will also aid in understanding specific etiological

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factors of pancytopenia seen at our tertiary care hospital of North India over a period of one and half year.

MATERIALS AND METHOD

Study Design: Cross Sectional Prospective Analytical Study

Sample size: 150 cases

Inclusion Criteria:

All the patients diagnosed as pancytopenia on complete haemogram to the department of pathology SMS&R were included in the study.

A detail clinical history and physical examination was performed in each case.

Exclusion Criteria:

Patients who were already been diagnosed with pancytopenia / bicytopenia.

Patients who have recently received blood transfusions.

Patients who do not give consent for bone marrow aspiration or biopsy (if indicated).

The complete blood count (hemoglobin, red cell indices, total and differential leukocyte counts, total R.B.C count and platelet count) was done by automatic hematology analyzer (Sysmex XP-1800i). Platelet counts obtained from counter were confirmed by peripheral blood smear examination. The peripheral blood smears were made for each case and stained with Romanowsky stain for microscopic evaluation. The bone marrow aspiration and trephine biopsies were carried out as per clinical indication. The specific indications in this context included persistent pancytopenia, fever, and lymphadenopathy etc. In 51 cases bone marrow aspirate and in 7 cases trephine biopsies were performed. All the aspirate and trephine biopsies were performed from PSIS (posterior superior iliac spine). The bone marrow procedure and further staining was carried out by standard protocols.[6-7] All the bone marrow aspirate smears and trephine biopsies were stained with May-Grunwald Giemsa and hematoxylin and eosin, respectively. Special staining of myeloperoxidase, Sudan black B, periodic acid Schiff and Perl's stain on aspirate smears and reticulin stain on biopsy were done as required.

RESULT

A total of 74 cases of pancytopenia were received for haematological studies, between June 2014 to June 2015 at tertiary care hospital of SMS& R, Greater Noida. There was male preponderance with male to female ratio was 1.32: 1. The most common clinical presentation was generalised weakness followed by fever, pain in abdomen, cough, nausea vomiting, bleeding, abdominal distention and palpitations. Chest pain and multiple fractures were also presenting complaints. On physical examination pallor was the most common clinical finding followed by splenomegaly, hepatomegaly icterus and multiple fractures.

Table 1: The range of hemoglobin in patients with pancytopenia

S. No.	Parameter	Range	No. of cases	Percentage
1.	Hemoglobin (gm/dl.)	< 3	3	4%
		3.1 - 6	50	67.56%
		6.1 – 7	21	28.37%
	Total		74	100

Majority of the patients had hemoglobin ranging from 3.1% - 6gm%.

Table 2: The range of total leucocyte count in patients with pancytopenia

Leukocyte count (cells/cumm)	No. of cases	Percentage
500 - 1000	1	1%
1100 - 2000	11	11%
2100 - 3000	39	39%
3100 - 4000	49	49%
Total	**74**	**100**

Most of the patients (49%) had total leucocyte count between 3100-4000 cells/cumm.

Table 3: The range of platelet count in patients with pancytopenia

Platelet count (cells /cumm)	No. of cases	Percentage
4000 – 20000	2	2%
21000 – 50000	35	35%
51000 – 100000	63	63%
Total	**74**	**100%**

64.8% patients had total leucocyte count between 51000-100000 cells/cumm.

Most of the cases showed dimorphic picture on peripheral smear (39.10%). Microcytic hypochromic picture accounted for 32.40% while normocytic normochromic was seen in 14.3% and macrocytic blood picture accounted for 13.97%.

Table 4: Pancytopenia patients in which bone marrow aspirate was performed

S.No.	Diagnosis on bone marrow aspirate	Number of cases	Percentage (%)
	Megaloblastic anaemia	26	50.98%
	Mixed nutritional anemia (Micronormoblastic erythroid hyperplasia)	7	13.72%
	Hypoplastic anemia	5	9.8%
	Iron deficiency anemia	2	3.92%
	Multiple myeloma	2	3.92%
	Metastatic carcinoma	2	3.92%
	Tropical splenomegaly	01	1.96%
	Myelodysplastic anemia (RA)	01	1.96%
	Non hodgkin's lymphoma	01	1.96%
	Aleukemic leukemia	01	1.96%
	Hemophagocytosis	01	1.96%
	Leishmaniasis	01	1.96%
	ITP	01	1.96%
	Total cases	**51**	**100%**

The most common finding in bone marrow aspiration of pancytopenia is megaloblastic anemia followed by mixed nutritional anemia, iron deficiency anemia (micronormoblastic anemia), hypoplastic anemia, iron deficiency anemia, multiple myeloma, metastatic carcinoma, tropical splenomegaly, myelodysplastic syndrome (refractory anemia), non hodgkins lymphoma, aleukemic leukemia, hemophagocytosis, leishmaniasis, ITP.

The bone marrow biopsy was performed in 7 cases of pancytopenia. Amongst these 2 cases were the diagnosed as metastatic carcinoma, 2 as multiple myeloma, 1 case each as of non hodgkin's lymphoma, leishmaniasis and megaloblastic anemia. Keeping in view the whole haematological profile of patient the etiology of pancytopenic patients was summarized

Table 5: The etiology of pancytopenia analysed in our study

S. No.	Etiology	No. of cases	Percentage
	Megaloblastic anemia	30	41%
	Mixed nutritional anemia (Micronormoblastic erythroid hyperplasia)	14	20%
	Hypoplastic marrow	5	7%
	Malaria	5	7%
	Iron deficiency anemia	4	5%
	Dengue	3	4%
	Metastatic carcinoma	2	3%
	Multiple myeloma	2	3%
	Tropical splenomegaly	01	1%
	Aleukemic leukemia	01	1%
	Non Hodgkins Lymphoma	01	1%
	Hemophagocytosis	01	1%
	Hypersplenism due to kala azar	01	1%
	Myelodysplastic anemia (RA)	01	1%
	Haemopahogocytosis	01	1%
	Undiagnosed	02	3%
	Total	74	100%

Of the 74 cases of pancytopenia, most common cause in our study was megaloblastic anemia (30 cases) followed by mixed nutritional anaemia (14 cases). The other causes in descending order of occurrence were iron deficiency anemia (4 cases), dengue infection (4 cases), multiple myeloma and metastatic carcinoma (2 cases each). The less common causes include tropical splenomegaly, myelodysplastic syndrome, non Hodgkin lymphoma, aleukemic leukaemia, hemophagocytosis, leishmaniasis and ITP with one case of each.

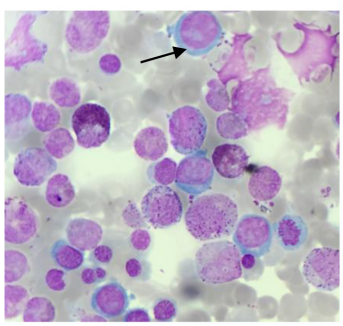

Figure 1: Bone marrow aspirate showing megaloblastic anemia. There is erythroid hyperplasia with erythroblasts showing open sieve like chromatin (Giemsa, 100X).

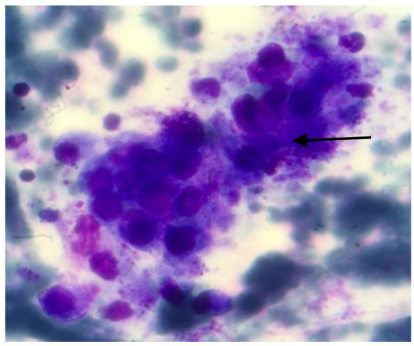

Figure 2: Bone marrow aspirate showing metastatic deposits (black arrow) (H&E; 100X).

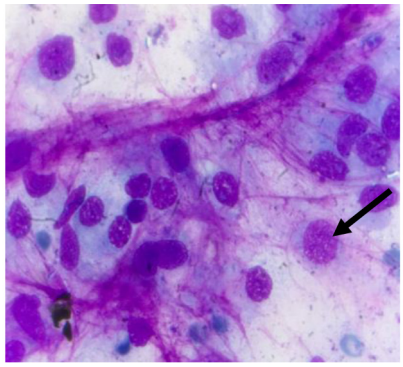

Figure3. Multiple Myeloma. Bone marrow aspirate showing increased immature plasma cells (black arrow) (H&E; 100X).

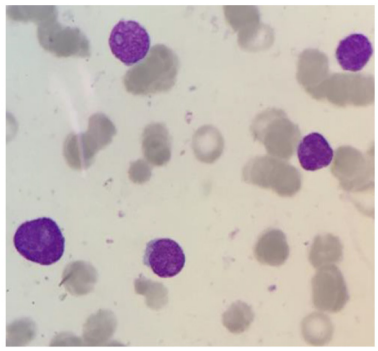

Figure 4: Bone marrow aspirate showing blasts. There were no blasts on peripheral blood smear; diagnosed as aleukemic leukemia (Giemsa, 100X).

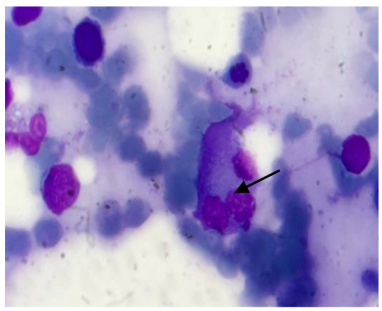

Figure 5: Bone marrow aspirate showing haemaophagocytosis. A monocyte is seen engulfing RBC (Giemsa; 100X).

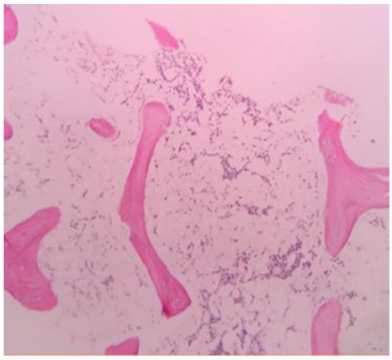

Figure 6: Bone marrow biopsy of patient diagnosed as aplastic anemia. There are increased fat spaces. (Giemsa, 100 X).

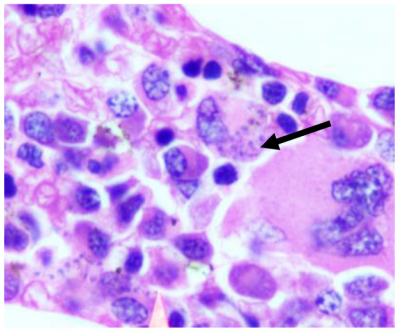

Figure 7. Bone marrow biopsy showing LD bodies (black arrow) (H&E; 100X).

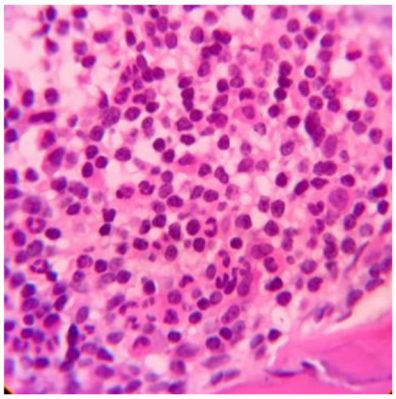

Figure 8: Bone marrow biopsy showing infiltration by atypical small and large mononuclear cells i.e. Non Hodgkin Lymphoma (H&E; 100X).

DISCUSSION

The age distribution of cases in our study was 2-80 years, which was comparable with other studies as Tilak et.al[6], B.N. Gayathri et al [7] who also performed on similar groups. The common age group affected was 1st-3rd decade in the studies done by Qazi et al[8], Khungeret al[9], Niazi et al[10] while in our study, most common age group was 21-30 years. There was male preponderance in our study. This was in agreement to other studies by Qazi et al[8], Khungeret al[9], Niazi et al[10] , Tilak et.al, [6] B.N. Gayathri et al [7] which also reported male preponderance. In the present study, most common presenting symptom was generalised weakness (94%), followed by fever (59%). Other symptoms were breathlessness, pain in abdomen and distension, easy fatigability and weight loss, chills and rigors, bleeding disorders, bone pain. The studies conducted by B.N. Gayathri et al [7] and Osama et al [11] showed generalised weakness (100%) as common presenting feature, followed by breathlessness (43.26%) while rest of the similar studies Tilak et.al [6], et al[8], showed presenting feature as fever and splenomegaly. In our study megaloblastic anemia (47%) was the most common cause of pancytopenia, followed by infections (17%), iron deficiency anemia (4%), mixed nutritional anemia (8%), aplastic anemia (5%), acute leukemia (7%), metastatic carcinoma (2%), multiple myeloma (2%), myelodysplastic syndrome (1%), ITP (1%), aleukemia leukaemia (1%),tropical splenomegaly (1%), hemophagocytosis (1%), non hodgkin's lymphoma (1%). The remaining 2 % cases were undiagnosed. In the study by Hossain M A et al[12], aplastic anemia followed by chronic malaria and kala azar were the common causes. Savage DG et al[13] found megaloblastic anemia to be the most common cause followed by aplastic anemia. Naeem Khan et al[14] reported aplastic anemia (20%) as the commonest cause followed by megaloblastic anemia (16.7%). It was noted that in most of the studies from India and other developing countries, megaloblastic anemia was the commonest cause. This was in sharp contrast to the studies from western countries where aplastic anemia was reported as common cause.

CONCLUSION

This study analyzed the clinico-hematological and etiological profile of pancytopenia in tertiary care hospital of North India. Of the 74 cases of pancytopenia, most common cause in our study was megaloblastic anemia followed by mixed nutritional anaemia. The other causes in descending order of occurrence were iron deficiency anemia, dengue infection, multiple myeloma and metastatic carcinoma. The less common causes included tropical splenomegaly, myelodysplastic anemia, non Hodgkin lymphoma, aleukemic leukaemia, hemophagocytosis, Leishmaniasis and ITP. This study highlights that fact that the presence of pancytopenia should be taken with great clinical concern and timely workup of such patients will aid in pointing toward

diagnosis or planning further investigations such as immunophenotyping and cytogenetic studies in majority of the cases in. In addition, an early recognition of the underlying conditions will have an impact on the mortality and morbidity in vulnerable patients.

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Sources of Funding: Self

Conflict of Interest: Nil

Ethical Clearance: Cleared

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Susceptibility of Gender Entrepreneurship Gap in India – A Prevue

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ABSTRACT

Prosperity of an economy relies on the equality of genders in all aspects. The aggregation of self-discipline paves way for proper civilization. Where there is egalitarianism, there is always the sign of Prosperity. The modus operandi of this study is to project the gender gap existing in the society. Chapter one provides basic information about entrepreneurship gap. Chapter two envisages the methodology of the study. Chapter three lists the review of literature. Chapter four recites the history of gender disparity from the last century. Chapter 5 estimates the level of entrepreneurship gap in post-liberlisation period of India. Last chapter concludes with the findings, suggestions and scope for the future studies.

Keywords*: Global Gender Gap, entrepreneur, women employer, working women, generation*

INTRODUCTION

The post-independence era of Indian economy has witnessed that she had failed to augment the gender gap in the field of entrepreneurship. The subsequent doses of reservation policy has brainwashed the community think astutely. The policy makers tried their level best to achieve the targeted economic growth nevertheless unable to meet both ends of targeted and actuals. They still talk about the percentage of women reservation in all fields rather than equality. The social security is colossal evil which castigate an unsecured state of affairs. After completing 69 years of independence and entry to the completion of 7th decade, it is the need of the hour to think and exert for finding a solution to susceptibility of Gender entrepreneurship Gap in India which may be a key to overcome the problems of gender related issues. According to WEF report, global gender gap has been widened. The encouraging progress on eradication of gender gap in the last decade has a twist, because the gender inequality has widened during 2017. World Economic Forum has witnessed in its Global Gender Gap report 2017, that India ranked 108 in GGG Index. The Robust challenges are ahead for the economic participation as our neighboring countries Bangladesh and China are ranked 47 and 100 respectively. In that report, they have considered four pillars namely, Health, Education, the work place and Political representation.

The current study focuses on the fifth pillar, the gender entrepreneurship gap. There are four elements that are to be considered to calculate the value of gender entrepreneurship gap-

1. Family brought up
2. Socio economic status of the parents
3. Working environment
4. Nature of business.

METHODOLOGY

Research gap:

Why there is a poor growth in women entrepreneurship in India.

Pilot study:

The current research was started with a pilot study of 25 random samples, in order to find out the feasibility of data collection and provisions for selection key factors to calculate the gender entrepreneurship gap. Based on the result of pilot study, the structured questionnaire was framed.

REVIEW OF LITERATURE

World Economic forum[1] exhibited its report on Global Gender Gap 2017, in which India is deteriorating in her position to 108th rank among 144 countries. During

2016, India got 87th position and during 2017, GGG Index moved to 108th position. The following table extracted from WEF Reports.

Down from 87 to 108									
Global Index		**Economic Participation & Opportunity**		**Educational Attainment**		**Health and Survival**		**Political Empowerment**	
2017									
Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
108	0.669	139	0.376	112	0.952	141	0.942	15	0.407
2016									
Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
87	0.683	136	0.408	113	0.950	142	0.942	9	0.433

Source : WEF report 2017.

It is unfortunate that our nation is facing the challenges both in (i) Economic participation and opportunity and (ii) Health and survival pillars, as she secured 139th and 141st rank among the total of 144 countries. This means that India is a third world country as for as Health and education is concerned which is the key factor for the entrepreneurship. However, we are having encouraged sign in political empowerment.

Sarah Kaplan[2], in her view, people may think that women entrepreneurship programmes (accelerators) with the best practices for women would be the right choice for the augmenting the gender gap in entrepreneurship, but it is actually a wrong presumption that many such programmes tried to made special efforts in participating women, failed due to disservice of female participants and they are exposed to hyper-competitive with men.

Mathew Lee et al.,[3] in their study, while describing about the hybrid ventures, they emphasized that the presence of women business owners in the community encourages female social entrepreneurs to pursue hybrid ventures business model A hybrid business model is a one in which the venture engages commercial activities in order to support its social mission.

Karen Bonner[4] in his research, elicited the fact that the number of women that went into business rose by 45 percent over the last decade, compared to just 27 percent among men.

Dr. S. Chandrachud[5], in my research article, mentioned that there is a disparity in the wage rate for the women employee. Due to lesser wage fixation for the women employee in leather industry, more and more young and unmarried women employees are preferred, as they never claim for the labour rights and submissive in the work place. Out of seven leather units inside the Special Economic Zone, MEPZ, not even a single woman employer is present irrespective of more than 70 percent are women employees in the zone

Evolution of Gender gap in post-independence period

Single hand never reach applaud but boo. If you want to clap, both hands should come together, likewise if you want welfare in the ecosphere, both genders should improve together. In the words of Swami Vivekananda, the Indian Philosopher, 'It is impossible to think about the welfare of the world unless the condition of women is improved. It is impossible for a bird to fly with only one wing'. The status of women in the initial stages of post-independence era makes us to regret that they were forced to fill the household space only. Irrespective of lot of debates over several decades, the folklore of patriarchy has subjugated the law of equality in gender participation. However, with subsequent doses of reservation policies, favorable to women participation, there were few pockets of improvement in their status. But still there is a wide gap between the genders with respect to health, brought up, infanticide, wage discrimination, nature of work, social security and so on. Even though, the literacy level of women is increasing with inception of professional participation of women, the expected rate of women liberlisation is not yet achieved due to lack of awareness about their privilege, hesitation to come out from nutshell, fear of parents about their daughters marriage, prevention of right opportunities to become professional, condition of age difference between the genders for marriage and rituals of social life. There

are lots of legislations that have enforced the rights of women, which failed in their purpose, due to social and political factors. For example, election in the women constituency contested by a woman candidate who is proxy of the respective male candidate.

Right from Dowry prohibition act 1961 to Sexual harassment of women at workplace – Prevention, Prohibition and Redressal Act 2013, there are number of legislations to protect the interest of the feminine gender such as National commission for women Act, the commission of Sati Prevention Act etc. that have been implemented[6]. However, there is no permanent solution for the protection of women welfare. The current study tries to find out a solution for the women welfare through the inception of women entrepreneurship to eradicate the susceptibility of gender entrepreneurship gap.

Women Entrepreneurship gap in post-liberlisation era.

In present day, women participation has considerably increased in most of the field. But still, there are many arena, in which, the role of women is NIL. (Nothing Is Listed). Especially, on the grounds of women entrepreneurship in selected labour intensive industries. For instance, the most successful export oriented and labour intensive industry in India – the leather industry is lacking with women entrepreneurship. As a matter of fact, more than 70 percent of the workers are women employees and many illegal issues against women is regarded, right from wage disparity, non-implementation of labour welfare act and sexual harassment of women in work place etc. In order to overcome all these problems, the best solution is to give privilege of women entrepreneurship in this industry. If the employer is women, a considerable reduction of women problems in work place will be reduced as the respective employer can understand the problem of the same gender and there is no question of sexual harassment and wage disparity. Providing education to women alone will not bring the fruitful result in the equal gender participation.

CONCLUSION

The present study has the following findings

1. Number of women employees is more than 70 percent in Chennai leather cluster.
2. There is no women employer in the leather cluster
3. Non-implementation of labour laws is prevalent
4. There is a wage disparity between men and women employee

The current study has listed the following suggestions

1. The government may come forward to solve the problem of non-implementation of labour laws
2. The government may lay a provision of privileged women entrepreneurship
3. The Encouragement of women entrepreneurship in leather industry may pave way to get appropriate solution for eradication of susceptibility of gender entrepreneurship gap.

Ethical Clearance: Completed. (Dept. level committee at VELS)

Source of Funding: Self

Conflict of Interest: NIL

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Economic Impact of FDI on Indian Aviation Sector

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ABSTRACT

Success of any economy depends on the performance of service sector. Aviation is one of the fast growing service sectors which may pave way for economic growth and development for the developing countries. India is one among the world's fast growing domestic aviation market. It gains the 9th rank in the global aviation market and it is projected to be the 3rd largest by 2020 and largest by 2030. The current study focuses on the economic impact of FDI on Indian Aviation Sector. Chapter one provides basic idea about the Indian Aviation Sector. Chapter two enlists the review of literature. Chapter three envisages the need for the foreign investment in Indian Aviation. Chapter four narrates the role of FDI in aviation. Chapter five elucidates the SWOT analysis of FDI on Indian Aviation. The final chapter concludes the current status of Aviation sector along with the discussion for future studies.

Keywords*: Aviation, FDI, Civil Aviation, Automatic route, PPP mode, SWOT.*

INTRODUCTION

As far as Indian transport sector is concerned, we are having the highest scope of effectiveness at global as India is the world largest peninsula. In all four modes of transport, Roadways, Railways, Seaways and Airways, India has the opportunity to become one of the best service providers in the world. Indian railway is the largest monopoly in the world and being the largest peninsula country, India is the predominant in seaways. Now it is the time to prove that Indian Aviation sector also is number one in the world as she has more than 80 international airlines which connects more than 40 countries and India's Revenue Passenger Kilometers (RPK) growth of 17.5 percent, which is higher than global average of 7 percent in 2017. The Domestic passenger traffic has crossed more than 100 million mark in 2017. As a matter of fact that India is one of the least penetrated air markets in the world with 0.04 trips per capita per annum as compared to 0.3 in China and more than 2 in the USA (2016)**[1].** Now India, has realized that Aviation sector is the right destination for Foreign Direct Investment (FDI) and allows 100 percent automatic route for airport projects and other services under the Civil Aviation Sector. It also extends 100 percent allowed under automatic route for Non-scheduled Air Transport Services and Helicopter services/seaplane services requiring DGCA approval.

REVIEW OF LITERATURE

The current study, concentrates on Economic impact of Foreign Direct Investment in the Indian Airways. There are many empirical and case studies are conducted in the various parts of the globe and selected literatures are given below.

Tay T.R. Koo, David Tan and David Timorthy Duval[2] Accoring to them, a cause–effect structure into the relation between tourism demand and air transport capacity. Specifically, they apply a vector error-correction model to assess if, and to what extent, capacity or passenger demand are first-movers that return to long-run equilibrium following short-run deviations. Using data on international aviation between Australia and our test cases of China and Japan, they find that demand on the Japan–Australia market corrects for short-run deviations from the long-run equilibrium quicker than the China–Australia market. Reasons for such variation in adjustment speeds are discussed and they show that the results are robust to the phenomenon of airlines pre-empting demand when setting capacity.

Rosie Offord, Stefan Kouris, Hannah Capek[3] Since the progressive implementation of the single aviation market began in 1992, the air transport market in Europe has undergone many significant changes. Passenger traffic has grown rapidly, stimulated by

new airline business models, a wider choice of air services, and lower air fares. The industry has also been changed by transnational alliances and mergers, and the bankruptcies of a number of carriers.

H.A.Wassenbergh[4] he suggested that the foreign landing rights for charter services should be regularized, as free as possible from substantial restriction. To accomplish this, intergovernmental agreements covering the operation of charter services should be vigorously sought, distinct, however, from agreements covering scheduled services.

Wang Lu, Li Hongtao Zhu Yaowen[5] With the trend of global trade to be an integral whole, the requirement of economic development and the change of political situation between China mainland and Taiwan, the air transportation cross the Taiwan Strait will be open gradually. The opportunities and challenges have been taken by the adjustment of cross-strait air transport policy and the realization of the normalization of air transportation.

Button Kenneth J, Taylor Samantha Y[6] According to them legislation in 1977 and 1978 effectively deregulated the US domestic air cargo and air passenger transportation industries in international air transportation, largely as the result of the `Open Sky' initiative from 1979 has also gradually been liberalized but progress has been geographically and temporally uneven.

Anming Zhang[7] In this study, a detailed conceptual frame work for the international air fright and air cargo between the Asia Pacific region with China are discussed. It also provides basic idea about the regional and global market for the aviation.

Need for the FDI in Aviation

There are various challenging factors, which may give rise to invest in aviation sector, According to the Ministry of aviation, the reasons for investing in the aviation sector, India is projected to be the third largest aviation market by 2020, and the largest by 2030. The Indian aviation sector is likely to see investments amounting to USD 15 billion during 2016-2020 of which USD 10 billion is expected to come from the private sector. Airport Authority of India (AAI) plans to revive and operationalize around 50 airports in India over the next 2 years to improve regional and remote air connectivity. Growth in aviation is also increasing demand for MRO (Maintenance, Repair and Overhaul) facilities.

The government of India has desperately initiate a greater focus on infrastructure development in terms of enhancing the liberalization policy and Open Sky Policy. Further, it extends upgrading the system through AAI driving modernization of airports and Air & Navigation Systems. The main reason for encouraging the FDI in aviation is to maintain world class infrastructure in all five international airports (Delhi, Mumbai, Cochin, Hyderabad, Bengaluru) which are operational under Public Private Partnership (PPP) mode.

In order to improve the Enhanced Skill Development, the foreign trade policy of India has a clear focus on FDI, to leverage India's human capital potential and create job opportunities and there is a provision for applying Innovation and Technology through GPS Aided Geo Augmented Navigation (GAGAN): India's first satellite based navigation system; NO Objection Certificate Application System (NOCAS): streamlines online process of timely NOC for height clearances of buildings around airports; E-Governance for Civil Aviation (eGCA): online delivery of 162 licensing and regulatory processes of DGCA.

The need for the FDI arises because of the sector polcy of government as regional connectivity scheme of UDAN (Ude Desh ka Aam Nagrik) initiated by the government in 2016 shall connect 56 unserved airports and 31 unserved helipads across the country. Operations have already started at 16 such airports. In 2017, NABH Nirman, announced, aims to expand airport capacity by more than five times to handle a billion trips in a year. The expansion will be funded by leveraging the balance sheet of Airports Authority of India. The Director General of Civil Aviation (DGCA) tries to make both ends to meet for the financial requirement of MROs – Maintenance, Repair and Overhaul services

Role of FDI in Indian Aviation

Foreign Direct Investment policy of India, has liberalized the foreign investment through FIPB (Foreign Investment Promotional Board) under three category - Airport, Air Transport services and Other Services (MRO)

1) Airports

a) 100% allowed under Automatic route for both greenfield as well as brownfield projects

2) Air transport services

a) Scheduled Air Transport Service/Domestic Scheduled Passenger Airline/Regional Air Transport Service - Up to 49% allowed under Automatic route. Government approval required beyond 49%

i) Non-Scheduled Air Transport Services and Helicopter services/seaplane services requiring DGCA approval - 100% allowed under Automatic route

3) Other services under the Civil Aviation sector

a) Ground Handling Services and Maintenance Repair and Overhaul Services

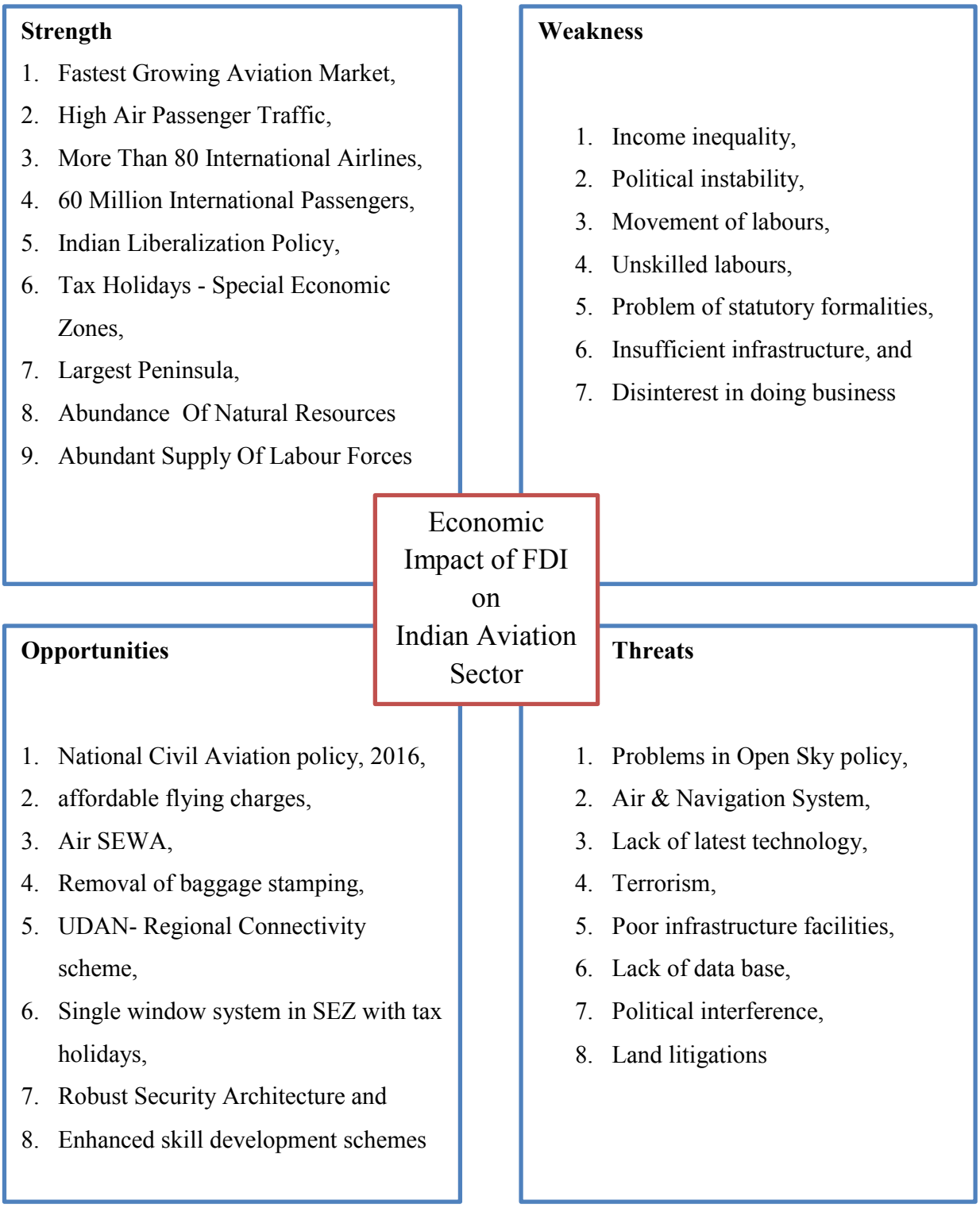
i) 100% allowed under Automatic route

The investment opportunities of Indian aviation sector, has been projected by the ministry of civil aviation, in terms of number of additional air flier in the next five years, requirement of MRO facilities, Construction of new airports, new projects of AAI and Special Economic Zones (SEZ) etc. The FDI for India has to augment investment gap. Firstly, 300 business jets, 300 small aircraft and 250 helicopters are expected to be added to the current fleet of Indian carriers in the next five years. Secondly, demand for MRO facilities is increasing in India, due to growth in the aviation sector. Thirdly, investment opportunities worth USD 3 billion in greenfield airports under PPP at Navi Mumbai and Mopa (Goa). Fourthly, the development of new airports – the Airport Authority of India (AAI) aims to bring around 250 airports under operation across the country by 2020. Fifthly, for development of aviation in the North-east region – the AAI plans to develop Guwahati as an inter-regional hub and Agartala, Imphal and Dibrugarh as intra-regional hubs. Sixthly, AAI has planned to spend USD 3 billion on non-metro projects between 2016 and 2020, focusing on the modernization and up-gradation of airports. Finally, Indian airports are emulating the Special Economic Zone (SEZ) Aerotropolis model to enhance revenues, focus on revenues from retail, advertising and vehicle parking, security equipment and services. Some of the Foreign Investors of Indian Aviation are

1. Airbus (France)
2. Boeing International Corporation (USA)
3. AirAsia (Malaysia)
4. Rolls Royce (UK)
5. Frankfurt Airport Services Worldwide (Germany)
6. Honeywell Aerospace (USA)
7. Malaysia Airports Holdings Berhad (Malaysia)
8. GE Aviation (USA)
9. Airports Company South Africa Global (South Africa)
10. Alcoa Fastening Systems Aerospace (USA)
11. Singapore Airlines (Singapore)
12. Etihad Airways (UAE)
13. Fairfax (London)

SWOT Analysis of FDI on Aviation

The SWOT Analysis is a management tool, which expresses the Strength, Weakness, Opportunities and Threats of the concept, for the purpose better understanding and for the comparative study about the pros and cons of the issue. As far as the economic impact of FDI on Indian Aviation is concerned, fastest growing aviation market, high air passenger traffic, more than 80 international airlines, 60 million international passengers, Indian liberalization policy, tax holidays of Special Economic Zones, Largest peninsula, Abundance of natural resources, Abundant supply of labour forces are the strength of Aviation sector. Income inequality, Political instability, Movement of labours, unskilled labours, Problem of statutory formalities, insufficient infrastructure, and disinterest in doing business are the weakness of FDI in Aviation. The government has initiated number of policies and schemes, in order to improve the development of Aviation sector, which are considered as opportunities of FDI in Aviation. The opportunities are National Civil Aviation policy, 2016, affordable flying charges, Air SEWA, removal of baggage stamping, UDAN- Regional Connectivity scheme, Single window system in SEZ with tax holidays, Robust Security Architecture and Enhanced skill development schemes. However, the problems in Open Sky policy, Air & Navigation System, Lack of latest technology, terrorism, Poor infrastructure facilities, lack of data base, Political interference, Land litigations etc. are the threat of FDI in Aviation



Source: Prepared by author.

Fig. 1 SWOT Analysis – Economic Impact of FDI on Indian Aviation Sector

CONCLUSION

The current research article, finds that India is yet improve the standard of aviation sector. India adopted liberalization policy in 1990, but only in the recent past, aviation has its momentum of improvement with twin effects of Global aviation scenario and liberalization of policy of India. While comparing advantages and disadvantages of aviation sector for foreign investment,

there are more positive impacts on Foreign Direct Investment in aviation sector, as India has an increasing demand on cargo as well as passenger fly. Most of the developing countries are interested in investing in India.

DISCUSSION

While preparing this research article, the data on energy resources for aviation and regional connectivity are having thrust area of research, as availability of sources and allocation of resources finds difficult due to social, economic, political and cultural hurdles. Even though the Ministry of civil aviation extends number of facilities, the sector finds difficult to serve the ultimate clients.

Ethical Clearance: Completed. (Dept. level committee at VELS)

Source of Funding: Self

Conflict of Interest: NIL

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Role of Public Expenditure on Indian Education System

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ABSTRACT

Modus operandi the study focuses on the emerging trends and changing pattern of public expenditures on education in the post-independence era. The share of investment on education is less than a percent of GDP. Chapter one provides basic idea about the mutual dependence between human resources, government expenditure and education. Chapter two briefs about the evolution of Indian education system in the post-independence period. Chapter three lists the review of literature. The fourth chapter enumerates the methodology of studies including problem statement, objectives and other methods use to analyze the role of public expenditure on education. Chapter six elucidate the literacy rate and its impacts, trend analysis of public expenditure on education and the last chapter concludes with findings and suggestions.

Keywords : *Education, Public expenditure, literacy rate and Children*

INTRODUCTION

Education is a critical input for human capital. Education not only provides the earning capacity and capability to the society but also stands for the moral values and ethics to lead a proper life with different qualitative benefits. It is intended to accrue knowledge to understand changes in the society and other scientific progresses and thus facilitates brainchild in the form of new invention and innovations. Investment in learing and teaching are the main sources of social wealth. In economic context, generating educational opportunities in a nation accelerates the development process through employment opportunities. Expanding the education leads to higher economic growth as it increase the real national income of a country. It is obvious that the input of educated person to economic growth is more that of an illiterate person. Educational influences rapid growth in the economy in all sectors which in turn improves the socio economic values of the society. It is to be note that mere education alone, will not lead to economic promotion, development or growth. India has enormous power in two areas namely, intellectual property and level of labour forces. The twin forces along with public expenditure on education may pave way for the espousal of new science and technologies and advocacy of increased productivity of the labour force. It also influences the evolution of politico economic institution and formulation new education system which augment the gap of academics and industrial requirement. The need of the study arises as the World Bank estimates indicated that nearly 125 millions of children at school age are out of schooling during the period of 1995, out of which India's share nearly 30 million in the same period. was Fortunately the growing countries have started expanding enrollments in the primary schooling through their public expenditure. Because of deliberate efforts, there are significant ranges of school aged children are now admitted in primary education institution.

EDUCATION IN INDIA

Right from the independence, Education department has the priority in developing the Indian education system. Pandit Jawaharlal Nehru, the first Prime Minister of India has announced that the education system should be revamped to achieve a secular democracy in the nation. While comparing with 14 developing economies of Asian Pacific [3], India position in 8th rank in Basic education, 7th rank in implementation of education programme, 6th rank in Equality in gender and 5th rank in overall performance in education in 2005. Since British colonial era, India blessed with well-designed higher education system, which was continued smoothly after independence. But the higher education focus of India emphasized with classlessness in education i.e.,

egalitarianism. This has given rise to new heights to wide and fascinated higher education systems and leads to 3rd largest manpower in both scientific and technical at global context. However, India find difficult with the global education race, due to delay in the liberlisation policy. India was the first Asian country started Export Processing Zone in 1965, but liberlisation policy was implemented only in 1990's. The delay of more than two decades, compared to other developing countries, results in nearly 30 percent of its population are illustrated in 1980's. During 1948, Indian government framed a University Commission with the headship of S.Radhakrishnan for purpose of improving the higher education in India. In 1952, one more commission called Secondary Education commission was also framed under the chairmanship of A.L.Mudaliar to receive suggestion from the academicians and public to authenticate the secondary education supplement to conduct of University Education. The Indian education system has emphasized on higher secondary level of education through positive linkage with primary education system. More public funds are allotted for these two systems, which in turn led to swift, unforeseen and uncontrolled expansion in the indian education system. During these periods only IIT and IIM s started. Nevertheless, in the absence required public infrastructure leads to underemployments and unemployment and some extent to emigrate to other nations i.e., indigenous brain drain. It is unfortunate, the persistence of mass illiteracy is big problem of Indian education system. UNESCO, 2003 estimates that the school aged children between 6 to 11 years are out of school in India are nearly 30 million which is one third share of total school aged children of out of school in the world. The majority of non-schooling children are from the states, Andhra Pradesh, Bihar, Madhya Pradesh, Rajasthan, Uttar Pradesh and West Bengal. These six states accounts for 75 percent of total non-schooling of indian non non-schooling children . The are many factors which influences the pattern of public expenditure on education such as low level of literacy, lesser educational attainment, disparity in the enrollment with respect to gender, incomplete and unplanned curriculum demand of child labour and labour market participation salient characteristic of Indian economy.

REVIEW OF LITERATURE

Francis and Iyare (2006)[4] had analyzed the association of education on development with respect to Caribbean nations Jamaica, Barbados, Tobago and Trinidad. The causal relationship between education and development is analyzed for the period of 34 years from 1964 to 1998.This time series data focuses on the data on public expenditure on education per head were obtained from earlier works and data on Gross National Income per capita taken from the World Bank Development Indicators and Online Database. The tools used in this study are applied intergration, VEC models (Vector Correction Models) to analyze the causal relationship between education and development. It reveals that in both the short run and long run, the per capita gross national income is driving education in all the three countries and education causes per capita gross national income in Jamaica in the short run. Thus it reveals bi-directional causality in the short run in Jamaica. There no evidence of causation running from per capita expenditure on education to per capita gross national income in either the short run or long run in Barbados, and Trinidad and Tobago. This study implies that the countries with higher per capita gross national income seem to be spending more per capita on education.

Pulapre Balakrishnan (2007)[5] points out that in India there is an option of finding a diverse set of arrangements in the provision of education. The reason for that was public education in India is not an uplifting spectacle. The unchanged fee structure in the university education, even as there is inflation in the system is destructive of the future of education as it undermines the resource base. A substantial hike in the fees is necessary and the higher subsidy for university education implies lower subsidy for school-going poor at the given total expenditure on education. It reveals that the improved governance is important when more resources allocated to progress the effective of education system in India. Mere investment on education will not bring required changes in the quality of education. It demands proper delivery of academic inputs and egular monitoring. There is a need for an audit agency for education, a statutory body of largely independent persons including educationists one selected globally to review in the form of annual audit, the functioning of the Indian educational system. The recognition should tilt the focus, the path of radically improving the existing public institutions and construction of new independent bodies regulate the deemed institutions and it is the duty of the respective state to maintain the same.

THE KOTHARI COMMISSION

In order to correct the unbalanced growth at various levels of education, the Government of India has formed a Commission under the chairmanship of D.C. Kothari to articulate a comprehensible policy of national education. After reviewing the post-independence progress in education, the commission clinched in 1966, that the tenacity of education was to build self-confidence and transform the Indian state to modern ceremonial. To attain modern ceremonial state with self-confidence, it has recommended the government provided compulsory education to all children in the nation at free of cost in their respective regional languages with the priority to Science, Technology, Research and Development. Perspective of this commission, end up with the flaw as the political environment in India during that period not favourable and the government failed to implement the recommendation and unable to mobilize the resources.

STATEMENT OF THE PROBLEM

Low levels of literacy, particularly among men and women and backward social groups, high rates of never enrolment and drop-out, high levels of non-attendance of children, poor levels of learning achievement and myriad other shortcomings are seemingly acceptable phenomena in the educational scenario of Indian society[6]. The purpose of education is to acquire few skills and self-confidence right from the childhood. On one side, the Wagner's view on government expenditure is that as the economy grows, the public expenditure also increases proportionately. On the other side, J.M. Keynes's view differs as the government expenditure increases the national income. The current study through light on two hypothesis, as the variables involved are public expenditure and education.

OBJECTIVES OF THE STUDY

To examine the progress of public expenditure on education and total expenditure made in education during 1990-91 to 2006-07.

LITERACY IN INDIA

India had 1027 million populations out of which 350 million were illiterates. Over the decades, literacy rates have shown a substantial improvement which has been clearly shown in Table 1.1. It is inferred that over the five decades literacy rate has been steadily increased from 18.33 percent in 1951 to 72.27 percent in 2011.

Table 1 Literacy Rates in India (1951 to 2001)

S. No.	Census Year	Literacy Level (in % of Population)
1.	1951	18.33
2.	1961	28.30
3.	1971	34.45
4.	1981	43.57
5.	1991	52.21
6.	2001	64.8
7.	2011	72.27

Source: Census of India

Gender Disparities in Access to Education

During 2000, a new agreement was made at United Nations Millennium Summit. The objective of this agreement was to eliminate gender disparity in primary and secondary education on or before 2005 and it should be extended to all levels by 2015. The recent studies and current discussion confirming that there is a disparity in education favourble to masculine gender and it has proved through access to education and training, completion of education processes, birthrate of genders and completion rates of students

Table: 2 Gender Gap in Literacy in India (1951 to 2001)

Period	Literacy Rate - Male	Literacy Rate - female	Gender difference (Gap)
1951	27.16	8.86	18.30
1961	40.40	15.34	25.04
1971	45.95	21.95	24.00
1981	56.37	29.75	26.62
1991	64.13	39.27	24.84
2001	75.3	53.7	21.6

Source: Census of India

In 2001, the net female enrolment rate of primary education is at 75.7 per cent, lagged behind the male enrolment of 88.5 per cent in India. The literacy rate for women is 53.7 per cent compared with 75.3 per cent of men. There are wide gender variations in the literacy rates. The southern states of Kerala, with a literacy rate of about 90.9 per cent, ranked first in India in terms of

both male and female literacy. Bihar a northern state, ranked first in India in terms of both male and female literacy. Bihar a northern state, ranked lowest with a literacy rate of only 47 per cent, 59.7 per cent for males and 33.1 per cent for females.

Table : 3: Share of Public Expenditure in Indian Education system

Year	Investment on Education	Index No.	Annual Growth Rate
1990-91	17193.66	100	-
1991-92	18757.61	109.09	9.09
1992-93	20952.97	121.86	11.70
1993-94	23413.1	136.17	11.74
1994-95	27232.15	158.38	16.31
1995-96	31516.59	183.30	15.73
1996-97	36371.64	211.15	15.40
1997-98	41109.32	239.09	13.03
1998-99	51225.26	297.93	24.61
1999-2000	61281.46	356.42	19.63
2000-01	62498.09	363.49	1.98
2001-02	64847.7	377.16	3.76
2002-03	68561.55	398.76	5.73
2003-04	73044.93	424.84	6.54
2004-05	81280.85	472.74	11.28
2005-06	97224.19	565.47	19.62
2006-07	111888.6	650.75	15.08

Source: Educational Statistics in India.

The share of public expenditure on education in India, during the period from 1990-91 to 2006-07 has increased sizably. The value of public expenditure on education has increased from Rs.17, 193.66 in 1990-91 to Rs.111888.6 in 2006-07. The index number has increased from 100 in 1990-91 to 650.75 in 2006-07 with fluctuations. The linear growth rate is 34.42 per cent. The lowest annual growth rate was 3.76 in 2001-02 and the highest annual growth rate was 19.63 in 1999-2000.

Trend Analysis of Public Expenditure on Education

The outcome of the trend analysis imply that the share of public expenditure on education in India increased annually by 3737.80 during the period 1990-91 to 2006-07[7]**.** The regression co-efficient of the semi-log linear model implies that the public expenditure on education increased at a comprehensive rate of 14.33 percent per year.[1]

The results of the trend analysis imply that the public expenditure on elementary level education of India increased annually by 2001.08 during the period 1990-91 to 2006-07. The regression co-efficient of the semi-log linear model implies that the public expenditure on elementary level education increased at a comprehensive rate of 12.75 per cent per year.

SUGGESTIONS

According to the government records, 52.8 per cent of the children who enter standard I drop put before they reach standard VIII, with children from prodigious preponderance of drop outs. Government of India should take necessary steps immediately to increase public expenditure on education to improve the education system and encourage the women entrepreneurship to eradicate the gender bias to reach new heights in economic growth in India.

CONCLUSION

The study has drawn some interesting observation from the nature of growth analysis of public expenditure on education in India. She is the second largest nation for the school aged children. There is no acceleration or deceleration in growth of public expenditure on education and total government expenditure. However, GDP has experienced acceleration in growth at the rate of 2.70 per cent per annum during 1990-91 to 2005-06.[2] It is expected that the Government of India should allot at least 6 percent of GDP on higher education, but it spends less than one percent of GDP.

Ethical Clearance: Completed. (Dept. level committee at VELS)

Source of Funding: Self

Conflict of Interest: NIL

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In Vitro Study the Effects of Anti-Fungal Agents on the Mycelial Growth of *Aspergillus Niger*

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ABSTRACT

The purpose of this study was to determine the sensitivity of *Aspergillus niger* to antifungal agents **(Terbinafine, Nystatin and Clotrimazole)** by using several parameter include minimum inhibitory concentration (MIC) , inhibition zone diameter and spores growth test . MIC value of Terbinafine showed highly effect compere with Clotrimazole and Nystatin . The *in vitro* study revealed that the Terbinafine have the potential to inhibit mycelial growth (inhibition zone diameter) of *Aspergillus niger* at concentrations of 1% , whereas Clotrimazole and Nystatin have lowest effect to inhibit mycelial growth of *Aspergillus niger* at concentrations of 1% and 100000 IU/ml respectively. Spore growth test for Terbinafine showed no growth of *Aspergillus niger* spores on SDA media through incubation in SDA at 28ºC for 5 days , While Clotrimazole showed no growth of *Aspergillus niger* spores on SDA media in the 3ed days of incubation , and Nystatin showed no growth of *Aspergillus niger* spores in the 5th day of incubation at same condition.

Keyword : *In vitro , anti-fungal agents , mycelial , Aspergillus niger*

INTRODUCTION

Mycological wound infections are one of microbes infection which invade wound by yeast or mould and occur in immunological disorder of human or animals[1]. There are several types of wound infection all these possible infected by microorganism [2]. Burn wound infection (BWI) is a major public health problem and globally the most devastating form of trauma. BWI is primarily caused by bacteria (70%) followed by fungi (20–25%), anaerobic bacteria and virus (5–10%). Fungi cause BWI as part of monomicrobial or polymicrobial infection, fungaemia, rare aggressive soft tissue infection and as opportunistic infections[3] Filamentous fungi considered important microbes that infect wounds in the diabetics and burns[4]**.** All types of Aspergillus spp. have the ability to invade damaged skin and various types of wounds and in recent years the skin has increased the incidence of this microbial[5]. In a recent study found that the ratio of Burn and wound infection with *Aspergillus niger* is 2.8% [6]. for that aimed of this study to determine the best of anti-fungal agent (Nystatin , Terbinafine and Clotrimazole) to treat the wound infected by *Aspergillus niger* .

MATERIAL AND METHOD

Anti-fungal agents

In this study used three types of common anti-fungal agent used to treat fungal wound infection include Azole group anti-fungal example Clotrimazole 1% , Polyene group anti-fungal example Nystatin 100000 I.U , and Allylamine group anti-fungal example Terbinafine 1%.

Aspergillus niger isolates

Aspergillus niger isolates were taken from bank of Microbiology lab. follow to Technical Institute of Babil /Community health dept.

Aspergillus niger spores count

The germination test protocol was adopted from[7]. Briefly, after *A. niger* was cultured on the SDA medium at 28ºC for 5 days, spores were collected and suspended in five ml of sterile normal saline. The spores concentration in the suspension was determined by using a haemocytometer method which include one drop of the suspension was added into hemocytometer chamber, spores were calculated under high power 40X of light microscope using the following equation[8]:-

Where:-Z= total number of counted spores (Spores number in 5 small square of RBCs count). N= total number of small squares (5 small square of RBCs count x 25 small square in each small square of RBCs count =80).

Final spore suspension should be obtained to equal to 10^7 spore /ml.

Anti-fungal agents sensitive test

Aspergillus niger

All anti-fungal agents were used in this study were purchased from the pharmacy (Clotrimazole tablet [100 mg], Nystatin tablet [500000 IU] and Terbinafine tablet [250 mg]) and mixed each one with SDA media after sterilization (Autoclave temperature 121ºC , For 15 mints at 15 Ibs) to obtain on Clotrimazole 1% , Nystatin tablet 100000 IU per 100 ml SDA and Terbinafine tablet 1%) , then five mm diameter disc of *A.niger* mycelia were cut by sterilized cork borer from the periphery of 5 day old culture and transferred aseptically in the center of SDA media contains different anti-fungal agents according to a pre-prepared concentrations. All petri plate including control and experimental were incubated at 28ºC for 5 days. After 5 days of incubation, observations were recorded and measurement of radial growth of *A. niger*[9].

Determination of minimum inhibitory concentration (MIC) of *Aspergillus niger*

MIC of anti-fungal agents were determined by tube dilution Method [10] , Ten test tubes with 8 ml of Sabouraud Dextrose Broth (SDB) in each were taken and autoclaved (temperature 121ºC , For 15 mints at 15 Ibs). Two ml of each anti-fungal agents (Clotrimazole 200 mg dissolve in 2 ml SDB , Nystatin 1000000 IU dissolve in 2ml SDB and Terbinafine 500 mg dissolve in 2 ml SDB) was added and serial double fold dilution was done up to the 10 tube and from the 10 tube, 2 ml of the mixture was discarded. To each tube ***A. niger*** spores ($1x10^7$ spore/ml) were added and mixed. The tubes were incubated for 5 days at 28ºC for ***A. niger*** . The least concentration of anti-fungal agents capable of inhibiting the fungal growth was considered MIC.

Spore growth test

This test is created by researchers to detect the viability spore growth after treated with anti-fungal agents (Terbinafine 1% , Clotrimazole 1% and Nystatin 100000IU/ml). After prepared stock solution for each anti-fungal agents (1% Terbinafine [1 gm of Terbinafine per 100 ml SDB] , 1% Clotrimazole [1 gm of Clotrimazole per 100 ml SDB] and 100000IU/ml Nystatin [10000000 IU per 100 ml SDB). Five test tubes for each concentration fill with 5 ml stock solution , then 100 µl of ***A. niger*** spores ($1x10^7$ spore/ml) were added in each test tube and mixed well. The tubes were incubated for 5 days at 28ºC . Every day of the five days of the incubation of above test tube , a swab is taken from the tubes and cultured on the SDA media and were incubated for 5 days again at 28ºC , figure(1).

Note :- SDB and SDA were sterilization by autoclave (temperature 121ºC , For 15 mints at 15 Ibs).

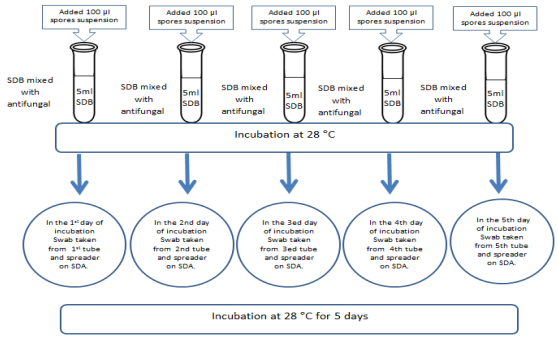

Figure (1) procedure of Spore growth test.

STATISTICAL ANALYSIS

Data analysis were computer analyzed using SPSS (Statistical Package from the Social Sciences, Inc, Chicago, Il, USA) version 13.0 for windows. Statistical analysis was performed by F-Test -one-way ANOVA analysis of variance. Variances were considered significant if $p < 0.05$[11].

RESULT AND DISCUSSION

According to the data analysis for tables and figures in this search were showed the different response between anti-fungal agents used against *Aspergillus niger*. Terbinafine drug was more effective in comparison with other anti-fungal agents (Clotrimazole and Nystatin) and control group used in this study.

The lowest MIC value of different antifungal agents against *Aspergillus niger* on SDB for 5 days at 28 ºC showed in Terbinafine in comparison with Clotrimazole and Nystatin, table (1).

Table (1) MIC value of different anti-fungal agents against *Aspergillus niger* in the SDA broth for 5 days at 28 ºC.

Antifungal	MIC value
Terbinafine	0.64 µg/ml
Clotrimazole	4 mg/ml
Nystatin	160 IU/ml

Inhibition zone diameter of *Aspergillus niger* was significant differences at (P<0.05) between all antifungal agents in comparison with control group, as table and figure (2).

Table (2):- Inhibition zone diameter of *A. niger* in the SDA media which contains Different anti-fungal agents in comparison with SDA media which contains distilled water. The age of colonies 5 days at 28 ºC.

Anti-fungal agent	Inhibition zone (mm) M±SE
Terbinafine 1%	4.44±0.04 A
Clotrimazole 1%	2.50±0.03 B
Nystatin 100000 IU/ml	1.70±0.06 C
Distilled water	0.00±0.00 D

LSD=0.33

Values represent mean ±S.E.

Different capital letters denote significant results (P<0.05) between different groups.

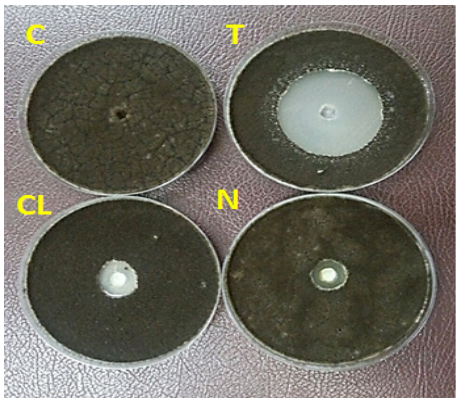

Figure (2) Inhibition zone diameter of *Aspergillus niger* on SDA media which contains different anti-fungal agents (T= SDA media contains 1% Terbinafine , N= SDA media contains 100000 IU/ml , CL= SDA media contains 1% Clotrimazole , C= SDA media contain distilled water . The age of colonies 5 days at 28 ºC.

SDA media which mixed with Terbinafine was showed no growth of *Aspergillus niger* spores through incubation period (5 days at 28ºC) , While SDA media which mixed with Clotrimazole was showed growth of *Aspergillus niger* spores through 1st and 2nd days of incubation but no growth was seen in the 3ed , 4th and 5th days of incubation at same conditions .SDA media which mixed with Nystatin was showed growth of *Aspergillus niger* spores through 1st , 2nd , 3rd and 4th but no growth was seen in the 5th day of incubation at same conditions , table(3) and figure(3).

Table (3):- *Aspergillus niger* spore growth test through 5 days of incubation periods at 28ºC on the SDA media.

Anti-fungal agent	Incubation days at 28ºC				
	1st day	2nd day	3rd day	4th day	5th day
Terbinafine 1%	-	-	-	-	-
Clotrimazole 1%	+	+	-	-	-
Nystatin 100000 IU/ml	+	+	+	+	-
Control group	+	+	+	+	+

(+) charge mean growth spores , (-) charge mean no growth spores

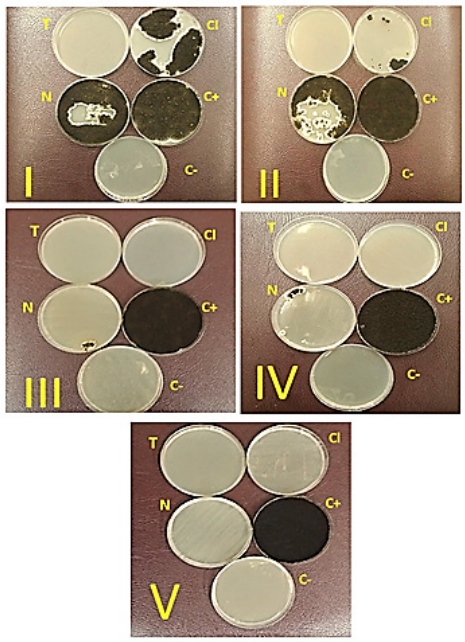

Figure (3)Aspergillus spore growth test. I= *SDA media cultured with* Swab taken from 1st tube (Tube containing SDB + antifungal agent+ spore of *Aspergillus niger*) , II= *SDA media cultured with* Swab taken from 2nd tube (Tube containing SDB + antifungal agent+ spore of *Aspergillus niger*) , III=

SDA media cultured with **Swab taken from 3ed tube (Tube containing SDB + antifungal agent+ spore of** *Aspergillus niger*) **,IV=** *SDA media cultured with* **Swab taken from 4th tube (Tube containing SDB + antifungal agent+ spore of** *Aspergillus niger*) **, VI=** *SDA media cultured with* **Swab taken from 5th tube (Tube containing SDB + antifungal agent+ spore of** *Aspergillus niger*) **, all SDA media incubated for 5 days at 28 ºC).**

In this study used three different anti-fungal agents belong to three different anti-fungal groups. Nystatin was used as Polyenes anti-fungal agents group example , these group act by hydrophobic interactions with cell membrane of fungi (Ergosterol) , which led to defect in the membrane functions. Pores formation in the cell membrane were occur and allows the efflux of K^+ ions and leading to cell mycological death[12].

Clotrimazole was used as Azole anti-fungal agents group example, these group act by inhibiting of Ergosterol cell membrane synthesis by inhibiting C14-a sterol demethylase enzyme . Cell membrane of fungi integrity is disrupted by the aggregation of sterol ten Nett and Andes precursors and the decrease of Ergosterol formation.

Terbinafine was used as Allylamines anti-fungal agents group example , these group act by inhibit squalene epoxidase enzyme , and led to Ergosterol biosynthetic (EB) inhibitors (These group characterized by inhibiting of EB in early steps) [13].

The variety response of deferent anti-fungal activity were used in this study against *Aspergillus niger* may be resulted from different causes.

First cause : Mechanism of action of anti-fungal agents.

In the current study showed the anti-fungal activity of Terbinafine against *Aspergillus niger* was more effective in comparison with Nystatin and Clotrimazole , according to parameter study were used. Terbinafine act on the first steps of Ergosterol synthesis by inhibition coincides with aggregation of the sterol precursor squalene and the loss of any other sterol intermediate formation[14]. whereas Clotrimazole act in late steps for EB inhibitors [15]. and Nystatin act by binding to Ergosterol (final steps of Ergosterol formation) and eventually forms channels in the fungal plasma membrane leading to cell lysis [16] but not interfere with Ergosterol biosynthesis steps [17]. , other cause Terbinafine which has been shown to be fungicidal against dermatophytes fungi(moulds and yeasts), while Clotrimazole considered as fungistatic and Nystatin is both fungistatic and fungicidal [18].

Multiple reports show that Terbinafine has potent activities against the saprophytic fungi, example , *Aspergillus* species [19]. In other *in vitro* study of th sensitivity of *Aspergillus* and *Candida* spp. obtained from ear fungal infection and they observed a potent activity of Terbinafine compared to nystatin , miconazole and clotrimazole[20].

Second cause: resistance of fungi against to anti-fungal

Mycological resistance refers to non- sensitivity of a fungus (mould or yeast) to an anti-fungal drugs by *in vitro* sensitivity testing[21].

The result of this study showed lowest effect of Nystatin than Clotrimazole in compares with Terbinafine,

These differentiation in response may be result from resistance of antifungal against *Aspergillus niger*. Nystatin-resistant have relatively low Ergosterol content in the cell membrane of *Aspergillus niger* [22]. Resistance to Nystatin may also be mediated by increased catalase enzyme activity, with decreasing sensitivity to oxidative damage [23].

There are four major mechanisms of resistance to azoles group antifungal include decreased drug concentration , Target site alteration, Up-regulation of target enzyme and development of bypass pathways [24] .

Third cause : the therapeutic concentration of antifungal agents used in this study .

The verity of antifungal agents effects of Clotrimazole and Nystatin in comparison with Terbinafine may be resulted from lowest concentration used for Clotrimazole and Nystatin were used in the treatment of *Aspergillus niger* .

CONCLUSION

Aspergillus niger isolate more susceptible to terbinafine than other antifungals gents (Nystatin and Clotrimazole).

RECOMMENDATION

1. Treatment of wound *Aspergillus niger* infection by Terbinafine.

2. Molecular study of Terbinafine , Clotrimazole and Nystatin effects on the cellular structure of *Aspergillus niger* .

Ethical Clearance- The permission was taken from the administration of the institute and the laboratory.

Source of Funding- Self funding

Conflict of Interest – (no Conflict of Interest).

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Emotional Intelligence and Performance of Manager in Manufacturing Industries
(With special reference to Automobile Industry)

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ABSTRACT

The Indian automobile industry has gained its importance as it is one of the largest automotive industries at global perspective which accounts for manufacturing 23.96 million vehicles during 2015-16. More than 7 percent of GDP was contributed by automobile industry. In order to manage the large scale production process and service required for the maintenance of vehicle, the human capital is in demand. The modus operandi of this study is to calculate the impact of emotional intelligence of the managers who are working in the manufacturing industries. For this purpose, a sample survey conducted in Indian automobile industry. Chapter one provides basic idea about the emotional intelligence. Chapter two lists the review of literature. Chapter three describes the methodology of the study. Chapter four analyses the impact of emotional intelligence of manager in automobile industry and the last chapter concludes with the findings and suggestions.

Keywords: *Automobile, Emotional Intelligence, Performance, Psychology, Empathy*

INTRODUCTION

Success of any business rely on the able administration which **in turn handling** the employees judiciously and empathically. The term Emotional intelligence refers to the capability to be aware of, rheostat, express one's emotion and to handle relationships judiciously, sensibly, rationally and empathically. There are three basic qualities that are mandatory for efficient manager for the current scenario are emotional awareness, emotional peace and emotional management. The emotional awareness is learned skill applied for thinking and inducing the problem solving attitude; the emotional peace is an ability to cheer up or pacify other people; and the emotional management is psychological gizmo to manage emotion. He who possesses these three skills can achieve the targeted management goal in any organization.

Problem Statement

In the current corporate scenario, smooth running of production process with the inception of different labour issues is a difficult task. The patience and skill of the manager is the key factor which catalyst the level of production.

The current study tries to check whether the Emotional Quotient or Emotional Intelligence of the manager improves the skill and development.

Hypothesis

H_0: There is no significant difference in performance with respect to Emotional Intelligence

H_1 : There is a significant difference in performance with respect to Emotional Intelligence

The current study throws light on the emotional intelligence of manager with level of performance who is working in the automobile industry. This study based on sample survey of 80 managers and executives in Kanchipuram District, who are engaged in automobile sector. The present study has used the statistical tools, both Karl Pearson's coefficient of correlation and one way ANOVAs to express the significance of emotional intelligence on performance.

The annual performance appraisal was collected from April 2016 to March 2017. 360 degree appraisal format is used to measure the performance. Points of scale are from 1 to 5, where 1 indicates low and 5

indicates high. Performances of the managers are rated by self, employees and higher officials.

REVIEW OF LITERATURE

John D Mayar[1] in his research article on Emotional intelligence, he has listed many situations where the intelligence is emotional or artificial. The study also tried to prove, does the emotional intelligence exist? If so what is its significance? Is it of any importance?

David L[2], this article suggests, 'To be effective, leader must have a solid understanding of how their emotions and actions affect the people around them. The better a leader relates to and works with others, the more successful he or she will be".

Kendra Cherry[3], in his article, he explain the components of Emotional Intelligence, such as self-awareness, self-regulations, Social skills, Empathy and motivation

Praveen N. Kulkarni, B.Janakiram and D N S Kumar[4], this research study found out that the emotional intelligence has a significant impact on the performance level of the Manager and Supervisors

Dalip Singh[5] In his study, he mentioned that application of emotional intelligence supports the managers and employees to recognize and understand emotions and using emotional intelligence to manage oneself and his/her relationship with others

CONSISTENCY OF EMOTIONAL INTELLIGENCE

The consistency of Emotional intelligence is measured by considering 5 components of Emotional Quotient. Right from Self-Awareness, it continued with Self-motivation, Social-motivation, Empathy and cordial relation. The consistency of these variables emotional scale are ranged from 0.742 to 0.903 (acceptable range) and overall consistency of coefficients of the scale is 0.817 which indicates the consistency of emotional intelligence scale is good and it provides room for further study

One way ANOVA has been applied to measure the level of emotional intelligence with level of experience. For this purpose, the same five components of emotional intelligence are considered. The mean values are ranging from 2.5 to 3.9. Lower the mean value lower will be emotional intelligence and vice versa.

Table 1 portrays the mean value for the respondents of various experience groups ranging less than 5 years, 5 to 10 years, 10 to 15 years, 15 to 20 years and above 20 years with self-awareness 3.43, 3.98, 3.82, 3.76 and 3.71 respectively. The standard deviations are ranging between 0.5 to 0.6. The F value is 2.428 and with .091 significant level which indicates there is significant difference between level of experience and self-awareness.

In case of self-motivation also there is no significant difference between level of motivation and self-motivation. The mean values of respondents of various level of experience are 3.61, 3.49, 3.96, 3.46 and 3.73 with Standard deviation 0.564, 0.561, 0.531, 0.518, 0.594 respectively. The F value is 2.348 with 0.062 **level** which indicates there is no significant difference between level of experience and self-motivation.

There is a significant difference between level of experience and social motivation as the F value is 9.469 at 0.000 significant level in 1% degree of freedom. The mean values of respondents are more or less nearer to 3 and the S.D is higher compared to self-awareness and self-motivation

As far as the Empathy factor of emotional intelligence is concerned, the mean value of respondents are 3.48, 3.29, 3.58, 3.63 and 3.24 with standard deviations 0.562, 0.536, 0.526, 0.561 and 0.506 respectively for the years of experience of the respondents with interval of 5 years. The F Value is 3.107 at 0.068 significant levels. This shows there is no significant difference between empathy and work experience.

Table 1: Emotional Intelligence level with experience

Factors	Experience	N	Mean	S.D	F Value	Sig (2 tailed)
Self-awareness	< 5 years	29	3.43	0.564	2.428	0.091
	5 to 10 years	24	3.98	0.543		
	10 to 15 years	16	3.82	0.522		
	15 to 20 years	7	3.76	0.497		
	> 20 years	4	3.71	0.582		
	Total	**80**	**3.77**	**0.549**		
Self- motivation	< 5 years	29	3.61	0.564	2.348	0.062
	5 to 10 years	24	3.49	0.561		
	10 to 15 years	16	3.96	0.531		
	15 to 20 years	7	3.46	0.518		
	> 20 years	4	3.73	0.594		
	Total	80	3.64	0.557		
Social-motivation	< 5 years	29	3.08	0.752	9.469	.000
	5 to 10 years	24	3.21	0.816		
	10 to 15 years	16	2.96	0.793		
	15 to 20 years	7	2.76	0.748		
	> 20 years	4	2.95	0.594		
	Total	80	2.98	0.748		
Empathy	< 5 years	29	3.48	0.562	3.107	.068
	5 to 10 years	24	3.29	0.536		
	10 to 15 years	16	3.58	0.526		
	15 to 20 years	7	3.63	0.561		
	> 20 years	4	3.24	0.506		
	Total	80	3.44	0.537		
Cordial relation	< 5 years	29	2.87	0.763	17.293	.000
	5 to 10 years	24	2.49	0.827		
	10 to 15 years	16	2.48	0.704		
	15 to 20 years	7	2.97	0.759		
	> 20 years	4	2.91	0.634		
	Total	80	2.71	0.737		

Source : Computed

There is a significant difference between level of experience and cordial relation as the F value is 17.293 at 0.000 significant level in 1% degree of freedom. The mean values of respondents are less than 3 and the S.D is higher compared to self-awareness, Self-motivation and empathy.

CONCLUSION

The present study is witnessing that there is a significance difference in performance with emotional intelligence with respect to two components such as social awareness and cordial relation. However there is no significance difference in performance while comparing

the level of experience and emotional intelligence with respect to self-awareness, self-motivation and Empathy.

Ethical Clearance: completed. (Dept. level committee at VELS)

Source of Funding: Self

Conflict of Interest: NIL

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The Enigma Era of SEZ in HRD

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ABSTRACT

Human capital generation is the right indicator for the sustainable development of the economy. The nation will have a dynamic growth, once it achieves high literacy rate, high standard of living, no poverty and high per capita income, self-sufficient in their resources and growth in human capital. The current study throws light on performance of SEZ in India with respect to two indicators, such as Investment and Employment. Chapter one provides basic about Special Economic Zone (SEZ). Chapter two enlists the review of literature. Chapter three describes the investment pattern of SEZ in India. Chapter four envisages the employment generation of SEZ in India. Chapter five analyses the investment value per employment in SEZ. The last chapter concludes the human capital employment status in SEZ.

Keywords*: SEZ, Investment, Employment generation, Human capital, performance of SEZ*

INTRODUCTION

India was the first Asian country that started Export Processing Zone in Kandla during late 1960's, knowing the importance of export and foreign investment in economic development. But she was not able to face the global competition due to several reasons such as tax holidays and incentives to the promoters were not attractive, absence of infrastructure facilities and concentration of export promotion activities alone but failed to implement the policy framework. In order to overcome all these shortcomings, SEZ scheme was incorporated through EXIM policy effective from April 2000. Special Economic Zones (SEZ) is a specifically delineated duty free enclave and free from all rules and regulations governing imports and exports, which shall be deemed to be a foreign territory for the purposes of trade operations and duties and tariffs.

The Government of India announced the introduction of Special Economic Zones to achieve the following objectives:

- Generation of additional economic activity
- Promotion of exports of goods and services
- Promotion of investment from domestic and foreign sources
- Creation of employment opportunities
- Development of infrastructure facilities

REVIEW OF LITERATURE

ARADHNA AGGARWAL,[1] in her working paper, has exposed the export performance of Export Processing Zones. According to her, the EPZ policy in India underwent gradual relaxation of procedural and operational rigidities. The changes effected in this policy since 1991 have been far reaching and significant. It is believed that the overall EPZ investment climate has an overwhelming bearing on the EPZ performance.

S. K. MISRA and V.K. PURI,[2] in their study, "A scheme for setting up Special Economic Zone (SEZs) in the country to promote exports was announced by the Government in the Export Import Policy on March 2001, The SEZs are to provide free environment for exports and are expected to give a boost to the country's export. The policy has provided provisions for setting up SEZs in the public sector, joint sector or by the State Government. It also announced that some the existing EPZs would be converted into SEZ. Accordingly, the Government has issued notification for conversion of all the existing EPZs into Special Economic Zones. Exports by SEZ units during 2004-05 were of Rs.18,309 croress."

M. SUCHITRA,[3] in her study, has pronounced that,

the Neo-liberal trade and economic policies have already resulted in the spread of an exploitative work culture in India and other developing countries, especially with regard to unorganised labour. As of now, apart from the huge revenue losses, large scale displacement of farmers and regional development disparities, the proliferation of SEZs will certainly worsen the plight of workers. In fact, promoting these export enclaves, where domestic trade, tariff and labour laws are not applicable, as the one and only way for the development which is likely to have negatively impact on the real development that the country needs.

CHANDRACHUD S,[4] the SEZ approvals are expressed under four stages based on their level of processing such as Formal approvals, in-principle approvals, notified approvals and exporting SEZs. Formal approval is awarded to those SEZs approved in-principle that can show that land has been assembled for the purpose. In-principle approval is the first stage of approval process given to the person or the State Government concerned incorporating additional conditions, if any specified by the Board while approving the proposal. Notified approval is the last stage of process after the Government is satisfied that the developer has legal possession and irrevocable rights over the proposed land to develop SEZ and has received all necessary approvals provided that leasehold right for the period of not less than twenty years and the identified lands is contiguous vacant land with no public thoroughfare.

Inflow of Investment in Special Economic Zone (SEZ)

Table 1: Inflow of investment in SEZ from February 2006 to 30 September 2017

INVESTMENT	INVESTMENT (AS ON FEBRUARY, 2006)	INCREMENTAL INVESTMENT	TOTAL INVESTMENT (as on 30 september 2017
Central Govt. SEZ	Rs.2,279.20 cr.	Rs. 15,662.35 cr.	Rs.17,941.55 cr.
State/ Private SEZs before 2006	Rs 1,756.31 cr	Rs. 11019.52 cr.	Rs,12775.83 cr
SEZ notified under the act	-	Rs. 4,18,115.05 cr.	Rs4,18,115.05 cr
Total	Rs. 4,035.51 cr.	Rs. 4,44,796.92 cr	Rs. 4,48,862.43cr

Table 1 depicts the incremental investment in Special Economic Zone (SEZ) from February 2006 upto 30th September 2017. The major Special Economic Zone controlled by the Central government has increased from Rs.2,279.20 crores to Rs.17,941.55 crores with the additional investment of Rs. 15,662.35 crores. The state or private SEZs before 2006 has the total investment of Rs. 12775.83 from Rs. 1,756.31 with the incremental investment of Rs. 11019.52 crores

Source : Fact sheet on SEZ, MOC, http://sezindia.nic.in/cms/updated-factsheet-on-sezs.php[5]

However, the Notified SEZ under SEZ Act has the huge investment of Rs. 4,18,115.05 croress (four lakh eighteen thousand one hundred and fifteen lakhs croress approximately) – i.e., Rs.418115,05,00,000 with one of the object of creating more employment opportunities.

Employment generation in Special Economic Zone (SEZ)

Table 2 envisages the Employment generation in Special Economic Zone (SEZ) from February 2006 upto 30th September 2017. The major Special Economic Zone controlled by the Central government has generated 1,22,236 persons in 2006 to 2,35,305 persons with the additional employment of 1,13,069 persons. The state or private SEZs before 2006 has the total investment of 99,400 persons from 12,468 persons with the incremental investment of 86,932 persons.

Table 2: Employment generation in SEZ from February 2006 to 30 September 2017

EMPLOYMENT	EMPLOYMENT (AS ON FEBRUARY, 2006)	INCREMENTAL EMPLOYMENT	TOTAL EMPLOYMENT (as on 30 september 2017
Central Govt. SEZ	1,22,236 PERSONS	1,13,069 PERSONS	2,35,305 PERSONS
State/ Private SEZs before 2006	12,468 PERSPMS	86,932 PERSONS	99,400 PERSONS
SEZ notified under the act	0 PERSONS	14,88,746 PERSONS	14,88,746 PERSONS
Total	1,34,704 PERSONS	16,88,747 PERSONS	18,23,451 PERSONS

Source : Fact sheet on SEZ, MOC, http://sezindia.nic.in/cms/updated-factsheet-on-sezs.php [6]

It is to be noted that Notified SEZ contributes 16,88,747 employment had been generated under the SEZ Act, Which is amounting to more than 75 percent of total employment generation. As on 30th September 2017, the total employment generated are 18,23,451 persons. Here the Enigma of proportion between the investment and Employment generation exposed. For creating the employment opportunities of 15 lakhs persons, the total investment of Rs.418115,05,00,000 in the last decade. One of the objective of SEZ policy is to create more employment opportunities by means of export promotion, world class infrastructure and tax holidays etc.,

Enigma Era of SEZ in Human Resource Development

While comparing the incremental investment and employment generation in the last decade, there is a paradigm in the proportion. Table 3shows the analysis of investment and employment generation during the last decade.

Table 3. Proportion of Investment made with employment generation in SEZ

Period	Investment	Employment (persons)	Investment per employment (Rs.)
Up to Feb. 2006	Rs. 4,035.51 cr.	1,34,704 PERSONS	2,99,583.53
2006-2017	Rs. 4,44,796.92 cr	16,88,747 PERSONS	26,33,887.25
As on Sep. 2017	Rs. 4,48,862.43cr	18,23,451 PERSONS	24,61,609.50
Incremental growth	111.23 times	13.54 times	8.214 : 1

Source : Calculated by author.

CONCLUSION

The present study finds a new exemplar thought about the SEZ performance. As per the government factsheet published by the Ministry of Commerce and Industry, during January 2018, as on September 2017, the proportion of investment with the employment generation is 8.214 is to 1. The investment made in SEZ during last decade increased by 111.23 times but employment generation increased by 13.54 times. Unfortunately, per employment cost in SEZ is approximately Rs. 24, 61,600. In easy words, the cost incurred to create one employment opportunity in Special Economic Zone is nearly 24.61 lakhs.

Therefore, the current study suggest that if this

investment are made in micro, small, medium enterprises, they may create more employment opportunities than current employment level, and the Gross Domestic Product will be considerably increased which in turn the possibility of more export promotional activity through MSME. Secondly, if a part of this investment made in the primary sector, India will be the number one country in the globe in food production.

DISCUSSION

The modus operandi of the current the current study, is to analyze the proportion of investment made in SEZ in the last decade with the proportion of employment generated in the same period. The inference of the current research indicates that there is an abnormal proportion between investment and employment generation in SEZ. This paves way for new research on Investment appraisal of SEZ, Human resource strategy of SEZ, re-structuring the EXIM policy and provision for better economic development etc. The current discussion exposes that high value for the investment in case of per employment generation ranging 24 to 25 lakhs.

Ethical Clearance: Completed. (Dept. level committee at VELS)

Source of Funding: Self

Conflict of Interest: NIL

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Parents' Awareness about Eating Habits for Children with Autism in Baghdad City

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ABSTRACT

A descriptive analytic design study was carried out at Baghdad City from 15th of October 2016 to 20th of June 2017. A non-probability sample of (50) parents were selected from Rami Center for Autistic and Slow Learners Care, AL-Nahrain Specialization Center for Autism Care and AL-Rahman Specialization Center for Autism Care. The data were collected by using a constructed questionnaire through an application of direct interview. The data were analyzed by using two statistical approaches: Descriptive and Inferential statistics. The study aims to assess the Awareness of parents about eating habits for children with autism in Baghdad City. The study instruments consisted of two major parts to meet the purposes of study. The first part is related to socio- demographic characteristics of parents and children with autism and the second part (25 items) is related to eating habits that followed from parents' while feeding a child with autism. The study revealed that parents of children with autism having poor level of awareness about eating habits for their children (86%), 10% of them having poor level of awareness and only two having good level of awareness toward eating habits (4%).

***Keywords*:** *Parents, Awareness, Eating, Habits, Autism*

INTRODUCTION

Are complex neuro developmental disorders [1]. Autism belongs to a spectrum known as autism spectrum disorders (ASDs) which also includes Asperger's syndrome, childhood disintegrative disorder, and pervasive developmental disorder not otherwise specified [2]. the definition for ASD based on two behavioral domains difficulties in social communication and social interaction, and unusually restricted, repetitive behaviors and interests that is accompanied by a severity scale to capture "spectrum" nature of ASD [1, 3]. In a recent study there has been a dramatic increase in the prevalence of ASDs in children. The Centers for Disease Control and Prevention reported that one in 88 children had an ASD in 2013, National Autism Association ASD manifested developmental delay with signs as early as 6 months By18 months f age social [1, 4]. The three main areas of difficulty that all people with autism share are sometimes known as the 'triad of impairments Difficulty with social communication. There are differences in the time course of electrical activity in the brain in people with ASD [2-5]. Early diagnosis is essential, with interventions designed for each child's specific needs. Behavioral therapies are most frequently employed. Lifelong intervention is oft en required; autistic individuals have normal life spans Nursing considerations Educate the parents and others regarding the child's diagnosis. Allow the parents to express grief, anger, and/or frustration regarding the child's diagnosis [3, 4].

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METHODOLOGY

A descriptive study was carried throughout the present study for the period from15th of October 2016 to 20th of June 2017. In order to assess parents' awareness about eating habits for children with Autism in Baghdad City and administrative arrangement was taken. The approval of the Nursing College Council upon the title and purpose of the study was issued. Then, many approvals

were obtained from different centers which have an administrative relation with this study. Approvals from the Rami center for autistic and slow learners care, Al-Nahrain specialization center were obtained to facilitate the mission of the study. A purposive (non-probability) sample of (50) Parents were selected from autism centers, these were assigned for study according to the following special criteria: parents of children diagnosed with autism from various age group, children aged from 3year to 18 years both sex (male and female) for children and parents. Parents from various educational levels, parents who agreed to participate in this study. In order to assess Parents' Awareness about eating habits for children with Autism, The questionnaire consists of two parts Part I: The demographic information includes data related to parent's characteristics such as (age, parenthood degree, educational level, Occupation) and children characteristic such as (age, sex, body mass index). Part II: The questions in part II are related to eating habits that followed from parents' while feeding a child with autism. It consisted of 25 items. The questionnaire was rated on a 3-likert scale: Agree (1), Uncertain (2), and Disagree (3).The awareness' levels of parent were divided bases on an opinion of statistician, supervised, and researchers to poor (25-41), fair (42-58), and good (59-75). The data was collected with constructed questionnaire through an application of direct interview as mean of data collection from 30th of January 2017 to 15thof February 2017. In the present study, the data were analyzed through the use of Statistical Package for Social Sciences (SPSS) version 20. Data were analyzed through the application of different statistical approaches Descriptive statistics: frequency, percentages, means and standard deviation Inferential statistics: Chi-square (X^2), Levels of significant Mean (M): Low= 1-1.66 Moderate= 1.67-2.33 High= 2.34 - 3 Body mass index status (BMI for children): Underweight = Percentile < 5 Healthy = Percentile ≥ 5 and < 85 Overweight = Percentile ≥ 85 and < 95 Obesity= Percentile ≥ 95

RESULTS AND DISCUSION

Demographic Characteristics of the Parents with Autistic Children Distribution **(Table 1)** Age Group of Parents; the current study revealed that 58% of the sample was at age ranging 30-39 years old. These results supported by Lundström (2010) [6] in the study conducted of Sweden found that the children of parents of 30-39 were 2.2 times more likely to have autism than the children of fathers younger than 29,providing the strongest epidemiological evidence to date that advanced paternal age is an autism risk factor. **Parenthood Degree**; the present study revealed that 66% of the sample was fathers of autistic children. These results disagreed with a study done by Reichenberg (2010) [7] who indicated that the higher percentage of their sample 74% was mothers. **Parents Level of Education**; With regards to parents level of education the present study showed that high percentage 38% were mothers of children with autism are graduated from college and followed by 28% that are able to read and write. These results disagree with a study done by Alexander (2009) [8] who reported that the majority of parents were not having much education, and he found that 25% were illiterate and 45% have their education till grade tenth. Regarding fathers of autistic children, the study indicated that the high percentage of fathers is graduated from college 36%. The present study showed that the majority of children 60% with age group of 6-8 years old **(Table 2)**. The results of this study disagree with results obtained by Shelton, et al. (2012) [9] who found that the children's age ranging between 2 and 14 years. Also the results of this study disagree with study done by William, et al. (2000) [10] who reported that 48% of children with autism their age were between 5and 6 years **Gender;** The present study showed that the majority of children 70% where male. This result was supported by Cohen, et al. (2006) [11] who stated that autism is four times more likely to appear in boys than in girls. **Body Mass Index Status** The current study analysis of body mass index status shows that 62% of them are obese, 16% are overweight, 20% only are showing normal weight and only one showing underweight status 2%.Its agree with Amarendra (2012) [12] who reported that most autistic children are observed to be overweight because of overeating. The presented study reported that hyperactivity the highest frequency 47.6% followed by tooth decay 22%. Regarding the duration of illness, more than half of children having the disorder from 1-3 years and 40% showing 4-6 years duration and only 6% are more than seven years duration of illness **(Table 3)**. The current study shows that parents of children with autism are having poor level of awareness about eating habits for their children 86%, 10% of them having fair level of awareness and 4% having good level of awareness toward eating habits **(Table 4)**. This study agree with study done by (Collins , 2003) [13] conducted on sample of children with autism and parents awareness about eats habits in Vijayawada city , it found that 15.0 % of parent have poor awareness ,29.0% have fair awareness

and 3.0% have good awareness about eating habits. Mean and Standard Deviation for Parents' Awareness toward Eating Habits **(Table 5)** shows the mean and standard deviation for parents' awareness related to eating habits in autistic children; the mean scores indicated that parents are poorly aware of eating habits evidenced by low significant for all items of eating habits except items 1,8, and 21. This study agree with study done by Budzienski (2014) [14] which explore that majority of parents were have low awareness about eating habits toward their children. The present study stated that there are no relationship between parents' awareness toward eating habits and their demographic characteristics, except that mothers' educational level are significant relationships with parents' awareness at p- value ≤ 0.05 **(Table 6)**. The relationship between parents' awareness toward eating habits with their children' demographic and clinical characteristics; the table indicated that demographic characteristics of autistic children with their parents' awareness that are presented as not significant at p-value > 0.05, while the clinical characteristics of the children indicated that medical problems are significantly associated with parents' awareness at p-value ≤ 0.05, and no significant relationship has been reported between the duration of illness and parents' awareness. This result agree with Idring et al., (2014) [15] they showed in the study were a significantly associated results

Table 1. Demographic Characteristics of Parents of Autistic Children.

No.	Characteristics		F	%
1	**Age group:**	20 – 29 year	5	10
		30- 39 year	29	58
		40 -49 year	15	30
		50 ≤ year	1	2
		Total	50	100
2	**Parenthood degree :**	Fathers	33	66
		Mothers	17	34
		Total	50	100
3	**Mother's educational level:**	Not read &write	0	0
		Read & write	14	28
		Primary Graduate	3	6
		Intermediate Graduate	2	4
		Secondary Graduate	5	10
		Institute Graduate	7	14
		College/high education	19	38
		Total	50	100
4	**Mother's occupation:**	Housewife	26	52
		Free business	0	0
		Governmental employ	24	48
		Retired	0	0
		Total	50	100
5	**Father's educational level:**	Not read &write	1	2
		Read & write	9	18
		Primary school	3	6
		Intermediate school	5	10
		Secondary school	7	14
		Institute	7	14
		College/high education	18	36
		Total	50	100

Cont... **Table 1. Demographic Characteristics of Parents of Autistic Children.**

6	**Father's occupation:**	Unemployed	2	4
		Self-employed	18	36
		Governmental employ	30	60
		Retired	0	0
		Total	50	100
7	**Source of information about eating habits:**	Doctor	31	62
		Nurse	0	0
		Internet	12	24
		Friends	4	8
		Media	3	6
		Total	50	100

No: Number, F: Frequency, %: Percentage

Table 2. Demographic Characteristics of Children with Autism.

No.	**Characteristics**		**F**	**%**
1	**Age group**	3 – 5 year	15	30
		6- 8 year	30	60
		9 -11 year	3	6
		12 ≤ year	2	4
		Total	50	100
2	**Gender**	Male	35	70
		Female	15	30
		Total	50	100
3	**Body mass index status**	Underweight	1	2
		Healthy	10	20
		Overweight	8	16
		Obesity	31	62
		Total	50	100

No: Number, F: Frequency, %: Percentage

Table 3. Clinical Characteristics of Children with Autism

No.	**Characteristics**		**F**	**%**
1	Problems:	Anemia	5	6.1
		Diarrhea	2	2.4
		Constipation	6	7.3
		Decay	18	22
		Obesity	12	14
		Hyperactivity	39	47.6
		Total	82	100
2	Duration of illness :	1 – 3 years	27	54
		4 – 6 years	20	40
		7 ≤ year	3	6
		Total	50	100

No: Number, F: Frequency, %: Percentage

Table 4. Levels of Awareness of Parents about Eating Habits for Children with Autism

Awareness' Levels	F	%	M.	SD
Poor	43	86	1.18	0.482
Fair	5	10		
Good	2	4		
Total	50	100		

F: Frequency, %: Percentage, M: Mean, SD: Standard Deviation

Poor = 25-41, Fair = 42-58, Good= 59-75

Table 5. Mean and Standard Deviation for Parents' Awareness toward Eating Habits

No.	Eating Habits	M	SD	Sig.
1	Give few amounts of foods that contain sufficient quantities of Iron (Such as Red meat, Liver, Dark colored vegetables)	2.06	0.793	M
2	Encourage a child with autism to excessive drinking milk along a day	1.58	0.810	L
3	Insist on a child with autism to eat sweets before a meal main dining	1.20	0.539	L
4	Encourage a child with autism to drink tea and coffee instead of fresh fruit juices	1.18	0.482	L
5	Not make a child used to brushing his teeth after eating each meal, especially before going to sleep	1.36	0.722	L
6	Increase having sweets and soft drinks	1.26	0.664	L
7	Do not give a child attention to wash his mouth with water when eat between meals	1.18	0.560	L
8	Not use of fluoride toothpaste	1.88	0.824	M
9	Increasing of acidic drinks and foods with high in acidity	1.48	0.735	L
10	Excessive eating foods containing vinegar	1.50	0.763	L
11	A child with autism does not visit the dentist every six months at least	1.50	0.735	L
12	Excessive eating of high-fat oil	1.46	0.706	L
13	Give child foods while playing and watching TV	1.58	0.883	L
14	Forcing the child to eat a lot of foods or complete his dish without rest	1.66	0.823	L
15	Eat more take away foods and leave the main meals	1.52	0.814	L
16	Make food as reward of good things or punishment of bad	1.58	0.810	L
17	Does not increase eating more fresh vegetables	1.28	0.640	L
18	Does not increase eating more fresh fruit	1.14	0.452	L
19	Eating too much canned fruit	1.22	0.465	L
20	Encourage the child to neglect breakfast	1.26	0.633	L
21	Use of full fat milk	1.70	0.839	M
22	The child must be alone when has his food	1.38	0.697	L
23	Use beating as a way of punishment in the case of the insistence of the child to eat one kind of food	1.24	0.591	L
24	Do not observe the expire date food when presented to the child	1.18	0.482	L
25	Lack of diligence on the diversity of food that provided to children with autism from time to time	1.20	0.495	L
Total		**1.42**	**0.678**	**L**

No: Number, M: Mean, SD: Standard Deviation, Sig: Significant

Table 6. Relationship between Parents' Awareness, their Characteristics and their Autistic Children.

Awareness Characteristics	Chi-square	d.f	P-Value ≤ 0.05	Sig.	Awareness Characteristics	d.f	P-Value ≤ 0.05	Sig.
Age	1.886	6	0.930	N.S	**Age**	6	0.849	N.S
Parenthood degree	2.576	2	0.276	N.S	**Gender**	2	0.213	N.S
Mother's educational level	29.247	18	0.045	S	**Body mass index status**	6	0.836	N.S
Mother's occupation	3.936	2	0.140	N.S	**Problems**	18	0.045	S
Father's educational level	10.772	12	0.549	N.S	**Duration of illness**	4	0.444	N.S
Father's occupation	2.543	4	0.637	N.S				
Source of information about health habits	2.648	6	0.852	N.S				

df: degree of freedom, P: Probability, N.S: Not significant

CONCLUSION

According to the findings of the present study, the researchers highlighted and concluded the following: Majority of parents was fathers at age 20-39 years old. High percent of parents their education level were college/high education. High percent of mothers their occupation was housewife. High percent of fathers their occupation was governmental employ. There are no significant relationships between parents' awareness with characteristics of their Autistic Children and clinical characteristics such as (Age, Gender, Body mass index status, Duration of illness); while the clinical characteristics of the children indicated that medical problems are significantly associated with parents' awareness at p-value ≤ 0.05.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under Rami center for autistic and slow learners care and all experiments were carried out in accordance with approved guidelines.

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Study of the Morphology of MB2 Canals in Maxillary First Molars Using CBCT

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ABSTRACT

372 human maxillary first molar teeth with three separate roots from the Dakshina Kannada population were selected for the study. Teeth with completely formed apices with no presence of any developmental defects were included in the study. Endodontically treated teeth and those with severe alterations in root canal anatomy were excluded from the study. Cone Beam Computed Tomography (CBCT) images of 372 maxillary first molars were processed using the ProMax 3D Mid (Planmeca, Helsinki, Finland) version – 4, and projected onto a Dell LED screen (Model no: E1913Sf) to observe sections in coronal, sagittal and axial views as well as a 3D reconstruction. Results showed that out of the 372 maxillary first molars evaluated using CBCT, 196 teeth showed the presence of MB2 canals (52.6%). Vertucci's Type II canal configuration was found in 163 (83.4%) teeth, Vertucci's Type IV canal configuration was found in 33 (33.6%) teeth.

Keywords: *Maxillary first molar, Cone Beam Computed Tomography, Dakshina Kannada, MB2 canals*

INTRODUCTION

The existence of a second canal in the mesiobuccal (MB) root of human maxillary molars has been the topic of countless studies and discussions. As early as 1925, Hess and Zurcher[1] showed the effects of these four canals on nonsurgical endodontic treatment. In fact, it has been suggested that upwards of 96.1% of maxillary molars have a second mesiobuccal canal (MB2).[2] Evidence to this date suggests that more MB2 canals are found in the laboratory than they are clinically. [3] It is commonly acknowledged that a substantial cause of failure of nonsurgical root canal therapy is caused by the lack of ability to effectively treat all the canals of the root canal system. Weine et al [4] have remarked specifically that the failure of endodontic treatment of permanent maxillary first molars is likely caused by the failure to find and obturate the MB2 canal. Revealing the location of the MB2 canal has proven to be the most formidable component of adequately treating these canals because it clearly must be done before cleaning, shaping, and obturation. Uncovering this canal proves to be very difficult in a clinical scenario according to Acosta and Trugeda [5] because of the commonality of excess dentinal deposition over the canal orifice. Various adjunctive magnification tools, such as magnifying loupes and dental operating microscopes are commonly used to increase the detection rate of MB2 canals in clinical situations. However, these microsurgical instruments are still not enough to locate and instrument existing MB2 canals in all cases. [6] Clearly, the longstanding issue at hand is to reveal a reliable clinical method[1] to confirm or deny the existence of the MB2 canal in these teeth and[2] allow for a three-dimensional (3D) picture of the orientation and location of the canal relative to MB1, palatal and distobuccal canals.

The use of cone-beam computed tomography (CBCT) scans have attracted remarkable attention in the field of dentistry as a diagnostic and treatment planning technique as of recent. [7]. CBCT scans have existed for nearly 30 years, [8] but only recent technologic

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breakthroughs have made CBCT scans available as a feasible option for the private dental office. [9] The main use till recent has been in the treatment planning of placement of dental implants. [10,11] From an Endodontic perspective, several potential applications of this technology exist. These include the assessment of non-Endodontic pathosis, internal and external resorption analysis, presurgical planning, [12] pathosis of Endodontic origin, and canal morphology. [13,14] The ability of computed tomography (CT) scans to observe pathologic conditions and anatomic structures in a three-dimensional reconstruction has proven to be incredibly useful, [13] and its ability to reduce or eliminate superimposition of surrounding structures makes CBCT superior to conventional periapical films. [15]

MATERIAL AND METHOD

372 human maxillary first molar teeth with three separate roots from the Dakshina Kannada population were selected for the study. Teeth with completely formed apices with no presence of any developmental defects were included in the study. Endodontically treated teeth and those with severe alterations in root canal anatomy were excluded from the study. The disinfection of teeth was done according to OSHA regulations. The teeth were kept soaked in 5% sodium hypochlorite for 24 hours followed by debridement of any periodontal tissue. The teeth were then stored in physiologic saline. The maxillary molars were mounted on a wax sheet and subjected to CBCT analysis.

The CBCT images of 372 maxillary first molars were processed using the ProMax 3D Mid (Planmeca, Helsinki, Finland) version – 4, and projected onto a Dell LED screen (Model no: E1913Sf) to observe sections in coronal, sagittal and axial views as well as a 3D reconstruction. First, the axial axis of each tooth was rectified on the sagittal plane and then 1 mm sections were obtained on the axial plane at 0.5 mm intervals for all the samples. A corono-apical exploration was made throughout the mesiobuccal root to detect the MB2 canal. Where this was present, the floor of the coronal cavity was located, and advanced apically in 1 mm sections (2 sections of 0.5 mm) to standardize observation of the MB2 canal.

The radiographic analysis was done by two blind observers. The contrast was adjusted and the magnifying tool was activated as required. The frequency of MB2 canals and the variation in the canal morphology were analyzed by CBCT analysis.

FINDINGS

A total of 372 maxillary first molars were evaluated using CBCT in this study, 196 teeth showed the presence of MB2 canals (52.6%).

Table 1: Analysis of presence of MB2 canals in CBCT

MB2 CANALS USING CBCT	FREQUENCY	PERCENT
Absent	176	47.4
Present	196	52.6
Total	**372**	**100.0**

In the tomographic evaluation, the number and types of root canals present in the mesiobuccal root were determined according to the Vertucci's classification system.

Vertucci's Type II canal configuration -two canals emerging from the pulp chamber that converge to a canal at the apex in the MB2 canal was found in 163 teeth that is 83.4% of the samples, Vertucci's Type IV canal configuraion - two distinct canals that begin at the chamber and end at the apex in independent foramina in the MB2 canal was found in 33 teeth that is 33.6% of the samples.

Results of MB2 canal morphology according to Vertucci's classification

Out of 196 teeth 163 teeth showed TYPE II morphology followed by TYPE IV morphology on 33 teeth.

Table 2: Presence of MB2 canals in CBCT according to Vertucci's classification

Vertucci's classification	Frequency	Percent
Type I	-	-
Type II	163	83.4
Type III	-	-
Type IV	33	16.5
Type V	-	-
Type VI	-	-
Type VII	-	-
Type VIII	-	-
Total	**196**	**100.0**

DISCUSSION

Presence of additional root canals can be confirmed using preoperative radiographs along with careful visualization and probing of the pulp chamber floor. Indistinct X-ray images, modified coronal access, and unusual location/size of canal openings are few simple indicators of likely aberrant anatomy.[2]

Prevalence of additional root canals has been reported and discussed by several authors, and a variety of study methods that has included radiographs, magnification, clinical evaluations, dye injection, tooth sectioning, and scanning electron microscopy have been used.[4]

The use of CBCT images is an important clinical tool in diagnosis and Endodontic treatment. [3] This test allows evaluating periapical lesions, internal and external resorption, verifying the morphology of the root canal, evaluating fractures, performing pre-surgical planning, and also verifying relationship with other important anatomical structures. The ability to reduce or eliminate overlapping of adjacent structures makes CBCT a superior technique compared to conventional periapical radiographs. [2, 11 - 16]

The results of the present study showed that Vertucci's Type II canal configuration was found in 163 teeth that is 83.4% of the samples, Vertucci's Type IV canal configuraiton was found in 33 teeth that is 16.5% of the samples.

The results of the present study are similar to a study done by Alavi et al in a Thai population where a similar incidence of Vertucci's type II canal configuration was found. In the same study they also found two or more canals at the apex in more than 46% cases which is similar to the results obtained in our study.[17] However they employed the clearing method in their study, which is one of the most accurate methods available to study the internal anatomy of the root canal system.

If the single canal in cases of type I and one of the two canals in cases of type II were endodontically treated and properly prepared and filled, the chance of success prognosis would be significant. In cases of type II, the unfilled canal, regardless of any retained tissue or debris, would be sealed from apical and oral tissues. In cases of type III, if only the largest canal is prepared and obturated, two situations may occur: if the tissue of the unfilled canal is vital and inflamed as a result of any pre-Endodontic treatment, pain can persist after the completion of Endodontic treatment; if the tissue of the unfilled canal is necrotic, the development of a periapical space may occur or an existing initial injury may perpetuate. [10]

CONCLUSION

The possibility of morphologic variations in a tooth should never be overlooked. Additional canals should be identified by all possible means as it enables the clinician to perform biomechanical preparation and sealing of the entire root canal system, thereby minimizing Endodontic failure. In addition to a properly designed access cavity, angulated radiographs and routine use of loupes is suggested as it greatly increases visualization and the likelihood of locating additional canals. The clinician should consider using CBCT as an auxiliary tool for confirming the presence of complicated root canal anatomy when conventional radiographs are not very conclusive. Use of CBCT in Endodontics is encouraged but should be limited to the assessment and treatment of only complex Endodontic conditions such as identification of root canal system anomalies and determination of root curvature.

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Barrier of Self Care Management on Urban Type 2 Diabetic Patients in Bali

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ABSTRACT

Successful glycaemic control could be achieved by diabetes self-care management. The purpose of this study was to explore the barrier of diabetes self-care management to type 2 diabetes patients in urban living. This study used a descriptive phenomenology design. The study was conducted at Mengwi village, Badung regency, Bali, with 20 participants was selected through purposive sampling. The data was collected using the in-depth interview. The result of the study showed most of the participant was male, the age was ranged between 45-60 years old and have been suffering from diabetes mellitus for 5-12 years. Three factors were found related to being the barrier of diabetes self-care management: lack of knowledge of diabetes management, lack of glycemic control, and complications of diabetes management. From the results, it can be concluded that patients with type 2 diabetes mellitus have been having trouble with doing self-care management. The type 2 diabetes mellitus patients experienced difficulties in performing diabetes self-care management.

***Keywords**: Barrier, Self-care management, Diabetes Mellitus*

INTRODUCTION

In the last two decades, there has been an increase in the number of diabetic patients worldwide. Changes in human behaviour and lifestyle have resulted in a dramatic increase in the incidence of diabetes in all over the world[1]. According to WHO prediction, there has been increasing number of DM patients in Indonesia from 8.4 million in 2000 to around 21.3 million people by 2030. According to the International Diabetes Federation, in 2009 the number of people with DM is predicted to increase from 7.0 million in 2009 to 12.0 million by 2030. Despite the prevalence rate difference, both reports show an increase in DM patients by 2-3 fold in 2030[2,3].

A poor diabetes mellitus management may lead severe complication[4]. The complications that may occur include diabetic ketoacidosis, hyperglycemia, hyperosmolar, nonketotic coma, hypoglycemia, retinopathy, nephropathy, neuropathy, angina, myocardial infarction, peripheral vascular insufficiency accompanied by intermittent claudication and gangrene of the extremities and cerebral insufficiency and stroke[5]. The incidence of DM patients who had a stroke in America in 2011 amounted to 36.6%. This number has increased from the previous year in 2010 by 35.7%[6].

A successful glycemic control can be achieved by performing good self-care management.[7,8] Mathew,et.,al,[9] found some themes about the experience of DM patients carrying out self-care management is implementing self-care DM management make them different from others, difficult to manage diet, and needed social support. The study by Carolan,et.,al[10] found that the DM patients' experience in diabetic self-care management which is DM is a hidden disease, a life struggle, working on DM management and support of health resources and services. Research by Onwudiwe,et.,al[11] stated that the things that affected implementation of self-care management in patients with low incomes were lack of knowledge regarding the target of glycemic control and some given health information were confusing.

MATERIALS AND METHOD

This study used descriptive phenomenology design which aimed to determine the barrier in performing

self-care management in patients with type 2 diabetes mellitus. This research was conducted in Mengwi Village. The participant criterion in this research was no communication disturbance, age 40-60 years old and have suffered type 2 DM at least 5 years. Ten participants were recruited. Data were collected through in-depth interviews with participants.

RESULTS AND DISCUSSION

The study found three themes. These themes (1) Lack of knowledge about management diabetes mellitus, (2) lack of ability in glycemic control management, (3) Complexity of diabetes mellitus management.

Insufficient knowledge concerning the management of diabetes mellitus. When participants were asked about the obstacles in performing self-care management of Diabetes Mellitus they mostly said that they had less understanding of diabetes mellitus management. Similar statements were revealed by other participants. Basically, of the ten participants, the topic of less understood and less aware of the management of diabetes mellitus continously repeated. This theme is derived from the analysis of several categories of knowledge about eating arrangements, knowledge of physical activity, knowledge of foot care and knowledge of weight management. This is supported by the statement of some participants, namely:

”I also do not understand about the size of the meal ... .. how much I must eat and drink ..... What can be eaten and drunk” (P1)

“If I have to manage my own meal, I cannot afford it. Because I do not know exactly what foods are allowed, what foods are forbidden. Then how many foods I should eat… I do not understand how to calculate it” (P4)

The participant’s statement indicates that they are unaware of the dietary arrangements for patients with diabetes mellitus. There are foods that may and may not to be eaten for patients with diabetes mellitus which is certainly very much so that the patient’s caloric needs still could be fulfilled. Revealed in the interview, participants didn’t comprehend the diet for patients with diabetes mellitus, although it has been described by health workers.

Besides of the knowledge of eating arrangements, it was also revealed that they had no knowledge respecting to physical activity. The physical activity, in this case, is exercise and other physical movements that produce sweat. This is revealed by some participants by stating that:

“Is there any benefit to my illness? I have a disease with blood sugar, is exercise able to lower blood sugar?” (P1)

“is there any effect of walking with sugar levels in my body?” (P2)

The statement indicates that they were less aware of the benefits of exercise to blood glucose levels for patients with diabetes mellitus. Further reveals the knowledge about foot care. They revealed that they are less aware of foot care for patients with diabetes mellitus. This is supported by the participant’s statement:

“I cannot take care of my feet… I do not understand how” (P1)

“I do not know if it should be specially treated” (P3)

“I do not understand if the foot should be treated properly” (P5)

“…because I do not understand how to take care of my feet, sir. All I do is take a shower and wash my feet. that’s all, sir” (P6)

“I also do not know if the feet need to be treated” (P7)

Statements about foot care are mostly revealed. There were five participants who revealed that they lacked understanding of foot care in patients with diabetes mellitus. They say that the main obstacle for them not to do the diabetes mellitus foot care for because they do not understand the treatment of the foot.

Furthermore, respect to the knowledge of weight management, it was also acknowledged that they barely comprehended the weight management for patients with diabetes mellitus. This was supported by the participant’s statement:

“I do not know why I have to set my weight… how much weight I should have…” (P1)

“I do not understand how to regulate my weight… does it have to be regulated?” (P2)

“Is fat the cause of the rising of blood sugar?... I do

not understand the fat thing" (P3)

This result was in accordance with a study by Onwudiwe, et al.[11] that the main obstacle in conducting self-care management for patients with diabetes mellitus with low income is the lack of knowledge about the target of blood glucose level and blood pressure. These results indicate that knowledge is a major obstacle for low-income patients with diabetes. The lack of such knowledge causes them to be incapable of carrying out the management of diabetes mellitus independently.

Another study by Bruno et al,[12] found that the limited knowledge and skills of patients and clinicians in determining the target of glucose, blood pressure and cholesterol. These limitations become an obstacle to achieve the goal of diabetes mellitus type 2 management. So the knowledge was also a constraint in achieving the goals. This was in line with the results of the study by Alzubaidi, et al [13], that lack of knowledge about health care affects the comprehensiveness of the treatment of patients with diabetes mellitus. It was also said that the lack of such knowledge will affect how patients manage their disease and where they are seeking appropriate services.

Research by Jansiraninatarajan[14], found the theme of knowledge level regarding the causes, complications and management of diabetes mellitus to be one that contributes to the adherence of blood glucose management. A research by Scha'fer, et al.[15] found that lack of knowledge about diabetes mellitus became an obstacle in developing education in patients with diabetes mellitus. This indicates that the knowledge factor becomes very important in developing the patient's capacity so as to be able to independently manage the disease.

Insufficient ability in glycemic control management is revealed in two categories: the ability to examine the blood glucose itself and the ability to determine glycemic control targets. The inability to examine blood glucose alone is a constraint that arises in in-depth interviews. Some of these reveal:

"I cannot check it on my own… because it's difficult…" (P1)

"I cannot check it myself, sir… I do not quite understand how and I'm afraid I do it wrong"(P4)

"I cannot check it myself, sir… it's a hard job and requires special skills ..." (P5)

"I cannot check my own blood sugar…" (P8)

Another obstacle that could be seen was the ability to determine the target of glycemic control. They were less likely able to determine blood glucose target for patients with diabetes mellitus. Some participants expressed the following:

"I do not understand how much blood sugar I should maintain… so is my sugar normal or not, huh… I don't know…" (P1)

"I do not understand, blood sugar should be how many, huh? My blood sugar is said to be high and sometimes said to be low ... I do not understand" (P3)

"I do not know how much fit for me… Without my knowing, my blood sugar is already high" (P5)

Inability to managing glycemic control becomes an obstacle to patient compliance. Determination of fasting blood glucose target is highly important in achieving the diabetes mellitus management level. This is in accordance with Perkeni[2] which says that patients should monitor target of diabetes mellitus control in order to be able to assess the success rate of its management.

The results of this study were supported by Onwudiwe[11], which found that inability to determine the target of blood glucose and blood pressure became an obstacle in performing self-care for patients with diabetes mellitus. DM patients independently determine their blood glucose and blood pressure targets according to their current health condition.

Another supporting study by Liliana[16] who found also that glycemic control is one of obstacles in performing self-care management. It is also said that ability to determine blood glucose levels both high and low become important in management of diabetes mellitus. Research by Sarah[17] found that the barrier related to diabetes care became one of themes that emerged in obstacles experienced by a pregnant woman with diabetes mellitus.

According to Perkeni[2], the control criteria are based on the results of examination of glucose levels, HbA1C levels, and lipid profiles. A well-controlled definition of DM is when blood glucose levels, lipid levels, and

HbA1C meet expected levels, as well as nutritional status and blood pressure, conform to the prescribed target. So the determination of the targets is the determinant factor for the successful DM management.

Participants revealed their difficulties in setting lifestyle. They said it was difficult, complicated, and other phrases that contain the fact that it was so complex. The most common difficulties revealed were the schedule setting, the amount and type of food to be consumed. It was supported by the following participant expressions:

"To organize the meal is difficult and complicated, sir… It is said that the quantity should be measured… well… that's the difficulties, sir" (P5)

"I think it is difficult to arrange a meal especially choosing the food to eat as well" (P6)

"I cannot set up my meal, sir… because it is complicated… this one is allowed, that one is not allowed" (P10)

Disclosure of other constraints by participants was the regulation of body weight. Weight was difficult to control because often feel hungry. This statement was expressed by some participants:

"…and managing body weight is complicated, sir…" (P1)

"Because of eating too much due to hungry, my body become like this, sir… You can see my body… I'm fat, aren't I?"

Another disclosure was the regulation of blood glucose levels. They complained about the high blood glucose levels. It was very difficult to regulate blood glucose levels to achieve the desired target. This statement was expressed by the participants:

"So, is my sugar normal or not? I don't know…" (P2)

"My blood sugar sometimes goes up sometimes go down… and that makes me confused to control it" (P6)

This complexity was one of the obstacles that patient was unable to manage the DM independently.

Another study by Carolan,[10] found that one of the themes, which was the life struggle to treat diabetes in patients with type 2 diabetes mellitus. It was revealed that how difficult the struggle in managing diabetes mellitus. It was illustrated that the difficulty of self-managing and requires full concentration to set meal schedules and choose the food. The study by Liliana[16,18] found a difficulty in regulating diet for type 2 diabetes mellitus patients including difficulty in regulating the quantity, quality and type of food; the confounder in controlling their selves in confronting the problem of eating. It was also found some physical activity constraints.

The limitation of this research was location of interview which was concentrated in one place, because of difficulty of locating the participant's home. This may have an impact on the flexibility and openness of participants when answering a researcher's question. Age range of participants between 40-60 years which may have an impact on generalizations, allowing the emergence of various opinions or statements from younger participants associated with barriers in self-management.

CONCLUSION

Based on the findings of this study, it can be concluded that found three themes related to the barrier in performing self-care management of diabetes mellitus in patients with type 2 diabetes as follows

1. Lack of knowledge about management of diabetes mellitus,

2. Lack of ability in glycemic control management,

3. Complexity in diabetes mellitus countermeasures.

It is expected for the next researcher to determine the location of the interview was agreed by both parties in advance so that participants more freely in answering the questions of researchers. The participants' stipulation is expected to be more equitable in terms of residence, age and occupation, as this will impact on the opinions of the participants.

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SWOT Analysis of the Midwife's Role in Controlling HIV / AIDS in Denpasar: Assessment of Barriers and Achievements

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ABSTRACT

The epidemic of Human Immunodeficiency Virus (HIV)/Acquired Immuno Deficiency Syndrome (AIDS) in Indonesia has entered the stage of the concentrated epidemic. We need to assess factors that are associated to the efforts to prevent transmission of HIV/AIDS from mother to baby by midwives in the public health centers and in the private practices in City of Denpasar using SWOT analysis. This research was a qualitative study by involving eight midwives coordinator and staffs in the public health center in the City of Denpasar, ten private practice midwives and two head of health care centers. Data were collected using in-depth interview guidance and observation sheets, and the study was conducted from June to September 2015. Data were analyzed using content analysis. The policy of the officer about screening and early detecting from the central level to the district was a major strength should be in point of view of midwives. The main weakness was the lack of awareness of the private practices of midwives to support the success of voluntary counseling and testing (VCT) and provider-initiated testing and counseling (PITC) programs and the cost of laboratory test before having an antiretroviral therapy was expensive. Midwives showed a big responsibility to prevent transmission of HIV to the fetus through early screening.

Keywords: *HIV/ AIDS, VCT, PITC, health care center, midwives, pregnancy*

INTRODUCTION

In Indonesia, the epidemic of Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) until now has been entering the stage of the concentrated epidemic in which the prevalence consistently exceeds 5%. Based on previous data,it was showed that HIV prevalence in key populations, especially direct and indirect female sex workers (FSW) were respectively 10.4 %, and 4.6 %, transvestites (24.4 %), customers of FSW (0.8 %), male sex with man (MSM) 5.2 %, and 52.4 % of injecting drug users(IDUs). In Indonesia, in 2011 the percentages of AIDS cases by age groups were 33.2% in 20-29 age group, 34.4% in 30-39 age group. On the other hand, the percentages of AIDS cases in under five age group 2.1%, and 5-14 age group were respectively 2.1% and 3.0%[1].

According to data from the Ministry of Health of Indonesia (2014), up to September 2014, the cumulative numbers of HIV and AIDS in Bali were the fourth largest after Papua, East Java and Jakarta. These numbers were respectively that Bali Province was 9,637 and 4,261. Moreover, the prevalence of AIDS was the third largest after Papua and West Papua, this was 109.52 per 100,000 population. In other words, cases of AIDS in Bali were one-third of cases in Papua and half of cases in West Papua [2].

Prevention of HIV / AIDS transmission has been a priority program in previous decades. In fact, in Indonesia, the increase of HIV / AIDS cases changes the management in the form of high needs of antiretroviral (ARV) therapy [1,2].Screening for pregnant women who visit primary health center or to the midwives private practice is held in the first trimester. Testing and counseling are done voluntarily by pregnant women to know about their HIV status. Midwives are health workers who have big responsibilities to care the pregnant woman, especially

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in order to prevent HIV/AIDS transmission from mother to infant during pregnancy. The advantage of early diagnosis and treatment for patients or individuals is to enhance life expectancy and quality of life of patients and reduce the transmission of HIV[3]. Thus, increasing e the knowledge of HIV status is the gateway to HIV treatment and prevention services or knowledge of positive HIV status associated with a decrease in sexual practices that are not secure[4]. Identifying people living with HIV in the community is a basis for highly active antiretroviral therapy (HAART) for prevention[5].

Not many studies discuss SWOT analysis to improve the Voluntary Counseling and Testing (VCT) and Provider Initiative of Testing and Counseling (PITC) by midwives in the work area. Such analysis includes strengths, weaknesses, opportunities, and threats. Moreover, SWOT analysis is easier to use and more effective in efforts to explore the roots of the problem and the appropriate management of local capabilities [6].

Denpasar is the center of government and tourist destination. As consequence of tourist destination, several areas such as Sanurprovide entertainment facilities tend to sexual transactions, a rapid growth of legal and illegal cafes, nightclubs, and karaoke.Dyson (2003), suggests that people's behavior changes as a result of the pace of urbanization, migration including the effect of tourism can improve the transmission of STIs, especially HIV/AIDS through risky sexual behavior and drug use [7].

MATERIALS AND METHOD

This study is a qualitative study to understand social phenomena, especially the efforts felt by midwives in the midwife service center (health care center and private practices of the midwife) related to VCT and PITC efforts and obstacles. A total of eight midwife coordinators, eight private practices midwives and two head of health care centers in four health centers in Denpasar were included in this study: Health care center or Puskesmas I, II, IV of South Denpasar and Puskesmas I of East Denpasar.

In-depth interview technique was used for collecting data from the head of the health center, the midwife coordinator for maternal and child health in health centers and private practice of midwives. Observation guidance was used to assess the condition of the room and the implementation of VCT in health-care facilities. The findings of observations were documented by the camera, tape recorder, and dairy. Data collection study conducted by researchers supported by three enumerators and two field officers who had been trained to make observations. Data collection was conducted from June to September 2015.

Qualitative data analysis through the three-phase flow models, namely: data reduction, data presentation, and verification which took place simultaneously. Research permit has been granted by the licensing agency and related institutions especially Department of Health in Denpasar City.The study was conducted on the approval of the health offices and respondents and in accordance with the maternal and child health programs.

RESULTS

The results of in-depth interviews to the midwife coordinator of maternal and child health program, showed that the main factors that support the strength implementation of VCT/PITC is the clearly regulation or policy from the center to the provinces and districts/cities belong to the regions. All midwife coordinator mentions that the rules and standards of prenatal care, especially for the first visit for pregnant women for HIV test became standard raw and followed by all the services of midwifery in the health center which is currently known as integrated Antenatal care (ANC).

The main weakness of VCT/PITC implementation in health care centers were limited facilities and infrastructure for HIV testing, especially room for inadequate or incomplete counseling, still being one with antenatal care room, preoccupation and the number of laboratory staff and midwife.

Major opportunity to increase the coverage of HIV testing or VCT/PITC is that most midwives in health centers have been trained as VCT counselors. The distance to the practice of independent midwives and health centers in Denpasar City is generally close is also a good opportunity to control HIV transmission.

The perceived threat that the achievement of VCT/PITC in the form of the high cost of laboratory tests for pregnant women before obtaining treatment if the HIV test result is reactive. Another threat is still low participation of private practice of midwives including physician practices to make VCT/PITC and the waiting time in the clinic long enough also cause pregnant women bored and canceled an HIV testing. Based on the

results of in-depth interviews, observations and inquiries to pregnant women and their husbands in government health facilities as well as in independent practice midwives, themes, and sub-themes related to the strengths, weaknesses, opportunities, and threats as described in the table 1below.

Table 1. Description of theme and subtheme on SWOT analysis by the midwife at health care center, private practice of midwife and doctor in Denpasar City

Theme	Subtheme	Midwives and doctor responds
Strength	Policy of VCT/PITC program	"the success of the PMTCT program in community health care due to the clear rules or division of tasks from the center to the health care" (Midwife 1) "All midwives in our health care centers have been trained for counseling on PMTCT screening" (Midwife 5).
	Facilities and infrastructure, human resources	"Tools and materials for HIV testing at health care center are available, especially the reagents" (midwife 5) "Midwives in health care center especially midwife coordinator have been trained as the counselor, so there is no problem including laboratory staffs there are two people" (midwife 2)
	Funding	"as long as I know that HIV testing is free of charge when pregnant women have health insurance" (midwife 5) "This HIV test as a part of integrated antenatal care, and there is no charge if the pregnant women have health insurance (Midwife 8)
Weakness	Major barrier in the implementation of VCT / PITC	"For the obstacles to the implementation of PMTCT in this health care is limited staff in the laboratory, there is only one person. In addition, there is no room for counseling, such as the condition of the ANC room, quite small and does not guarantee confidentiality" (Midwife 2). "It is usually difficult if the pregnant women come only once to the health center, after that move anywhere so hard to detect where is she" (Midwife 5). "If the laboratory staff does not exist, because of the outside activity, then the possibility of pregnant women are not examined to be more" (Midwife 1)
	Efforts to overcome obstacles/ barriers	"We provide explanations to the couple about the purpose of the HIV examination in detail" (Midwife 3)
	Waiting time	"Pregnant women often complain that their husbands do not want to wait long, because they have to work, while the number of visits per day can be more than 10 people" (midwife 2)
Opportunity	Counselor training	"The midwife in the health care center has been trained as a PMTCT counselor, and the coordinator is a doctor (midwife 5)

Theme	Subtheme	Midwives and doctor responds
	Schedule for Antenatal care	"In this health care is providing ANC service every day, not made a special schedule so that pregnant women we can check HIV/AIDS testing" (Midwife 7)
	Number of pregnant women visits	"The averages of number of visits of pregnant women at the health care center between 300 to 400 pregnant women each month. Achievement of targets at the health care center has exceeded the target set "(Midwife 2)
Threat	Funding	"Currently the funding for PMTCT activities is decreasing, the Global Fund has reduced its assistance, but we remain optimistic if the government can overcome it" (Head of health care center 1) "If pregnant women are known to have reactive results, the costs incurred for follow-up are quite expensive before ARV drugs are given, so many refuse" (Midwife 3)
	Standard of Intervention	"We already have a standard or reference in the implementation of PMTCT, so clearly the division of duties" (Midwife 2)
	Motivation of midwife and obstetrician for HIV testing	"I look forward to the assistance and cooperation of private practice midwives to keep informing and sending pregnant women to the health care center for HIV test" (Midwife 3) "Many obstetrician never suggest pregnant women for HIV testing including awareness of private practice of midwives" (Midwife 4).

Source: Primary Data (2015)

DISCUSSION

Based on the results of a study in Argentina by Socias et al (2013), that is estimated at 110,000 people who living with HIV / AIDS, nearly 40% of them do not care about their status, and 30% were diagnosed at the stage of rapid immunosuppression[8,9]. Thus, universal HIV screening is cost-effective in areas with a prevalence of more than 0.1% and HIV testing is generally the initiative of the client[5,9].

According to the conceptual framework of factors affecting client utilization to health and sexual health facilities, several factors have been identified that affect the utilization of health care facilities including HIV testing. These factors include socialization of the program through job training, regulations, current policies, infrastructure, financing, social culture, client knowledge, feeling comfortable, waiting for time, attitudes and behavior of midwives health providers [6,10,11]. Routine HIV testing during pregnancy together with counseling and approval procedures after proper disclosure may increase the number of pregnant women who perform voluntary HIV / AIDS testing [11,12].

According to Burhan and Rialike, that knowledge of HIV / AIDS among infected women is the most influential factor in the utilization of health services[13]. Socio-cultural, the stigma against people with HIV / AIDS is a factor that can reduce or prevent women, especially pregnant women to perform HIV / AIDS examination including examination of syphilis and other sexually transmitted diseases. Adeneye .et al. and Delius & Glaser[10,14], argue that the limitations of information on sexual health for women, including myths and misconceptions about HIV/AIDS and morality lead to low knowledge of HIV/AIDS transmission.

In contrast, the results of the study in Nigeria[15], found that awareness of pregnant women on the prevention and transmission of HIV/AIDS from mother to child is quite high at 74.5%, as well as on how HIV/AIDS transmission pregnant women of 77.6%. The low effectiveness of sustainable comprehensive services to

tackle HIV/AIDS in the form of low commitment and mutual trust among stakeholders is one of the obstacles to the success of the HIV/AIDS prevention program in Surakarta City in addition to budgetary constraints and program priorities[16]. Local government support in preventing and preventing HIV / AIDS has not been optimal, which has an effective prevention and management effect[17,18].

The factors that support or inhibit the success of the program VCT and PITC in the city of Denpasar City is not much different from the previous results. The main obstacles and challenges of the midwife awareness to support the success of the program in self-employment, as well as the awareness of obstetrician specialists to jointly support the implementation of PMTCT through VCT and PITC.

The study has several limitations, such as the study was only conducted in urban areas with adequate infrastructure and limited sample size. Secondly, this study only targeted midwives and did not involve obstetric specialists, so it can be known more widely the supporting factors and inhibition of VCT examination in pregnant women with higher socioeconomic level.

CONCLUSION

The main strength of the implementation of VCT is the existence of policies from central to local levels and human resources or health personnel, especially midwives who have been trained to be counselors. The main weakness is not all midwives private practices implement VCT/PITC and the number of visits of pregnant women is high. The main opportunity is that almost all midwives in health centers in Denpasar City have been trained as counselors. The main threat is the cost of laboratory tests before antiretroviral therapy is given to pregnant women with expensive reactive tests.

Midwives and obstetricians have a big responsibility in VCT and PICT program through the provision of reagents in private practice and mobile VCT activities regularly. More active efforts from professional organizations, especially the Indonesian Midwives Association from the central level to the district to emphasize the importance of VCT and PITC into the counseling activity.

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Awareness on Knowledge of "Cadres" in Measuring Anthropometry at Post Services Elderly

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ABSTRACT

The awareness of someone's ability to maintain and to keep life has become better; hence having longer life expectation became a grace and a pride. It is estimated that life expectation figures maximally up to 125 years. This tendency increment on elderly population shall take special attention especially on their quality life improvement so that they can maintain their health. Anatomy changes take place on elderly. Elderly body shape for male or female happen to decrease in height that is 5% shorter compares to the age of 20, which is caused by many factors like hunchback and spine bending due to osteoporosis, kifosis because of aging process and other sickness' effect. The role of health "cadres" is very important in medical services for elderly society through post services elderly. It is found through verbal interview at post services elderly by health 'cadres" that had difficulty to measure anthropometry the height of elderly due to dysfunction equipment. Skill training in using ergonomics knee high anthropometry is proven to increase knowledge and skills in determining the nutritional status of the elderly. Having design height measurement of knee ergonomic to all health "cadres" is much convenient when measuring height of the knee take place, to determine nutrient status for elderly

Method: This research is an experimental with treatment by subject design and 50 respondents from cadres post services elderly in Denpasar Bali. Samples are given two treatments, Pretest (sample using the oldmeasuremen) and Posttes (sample using ergonomic design height measurement of knee).

Result: on the average cadres post services elderly, in regard with measuring anthropometry is experiencing increase in score as much as 24,36 with grade p<0,000. Satisfaction utilizing equipment as much as 20,36 with grade p<0,000.

Keywords: *Awareness, knowledge, anthropometric, post services elderly.*

INTRODUCTION

The success of national development has caused the rising life expectancy at birth, from 68.6 in 2004 to 70.6 in 2009. Population ageing has grown rapidly, especially in the developing countries in the first decade of this millennium. In 2010, the proportion of the elderly population was around 24 million and in 2020 it is estimated to be about 30-40 million[1]. Elderly is a person who has reached 60 years of age. Awareness of one's ability to maintain and sustain his/her life is getting better, so that having a longer life expectancy is reasonable. Today's elderly is no longer happens to have a long life, but due to the success of development and most of those elderly people are rich, healthy, highly educated, former officials like former ministers, director generals, governors, regents, and other officials. The number of elderly population and their rapid growth cause various problems, so that the elderly need to get serious attention from all sectors in order to improve their welfare. The role of health cadres is very important in health services in community level through Health Centre for Older

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People[2]. From result of the interview in the health centre post for older People, some health cadres found it difficult in anthropometric measurements of the elderly height caused by inappropriate measurement tools. With ergonomic design of knee height it is comfortable to the health cadres to perform knee height measurements to determine the nutritional status of the elderly**.**

MATERIALS AND METHOD

Elderly

Elderly is the final stage of the aging process, characterized by declining physical abilities, which began with a few changes in life. Elderly people tend to experience decreasing physical, psychological, and social condition[3]. Wear and Tear Theory: cells become damaged because they are used and misused too often. Organs' function, such as liver, stomach, kidney, skin, and others is decreased due to toxins contained in the food and environment, excessive consumption of fat, sugar, caffeine, alcohol, and nicotine, ultraviolet light, as well as physical and emotional stress. The damage is not only confined to the organs, but also occurs at cellular level. Therefore, when the body grows older, the cells feel the effects, regardless of how healthy one's lifestyle is.DNA damage: The process that is thought to underlie aging is the imperfect molecular repair and as a consequence, there is an accumulation of molecular damage all the time. The damage can be in form of broken DNA thread, covalent bond formation, and chromosomal rearrangements. The cause of molecular damage can come from both internal and external. Internal causes include free radicals and glycosylation, whereas external causes cover radiation, pollution, and gas and chemical mutagens. DNA damage accumulates over time until severe damage occurs compared to its normal condition. Free radical hypothesis: This hypothesis received greater attention since the use of antioxidants is believed to inhibit free radical damage. Free radicals are molecules produced as byproduct of the normal cellular metabolism, such as superoxide radicals, hydroxyl, and pyrimidine. The main molecules in the body that is damaged by free radicals are DNA, lipids, and proteins. In addition, free radicals also damage collagen and elastin, a protein that keeps skin moist, smooth, flexible, and elastic[4].

Psychological Change

Anatomical changes in the elderly affect almost all anatomical body composition, and changes in cells function of cells, tissues, or organs. Physiological changes that occur in the elderly are as follows:

Human's optimal physical ability is achieved at the age of 25-30 years, while physiology capacity will decrease 1% per year after passing its high point. Aging process is characterized by weaken body, slower and less force full movement, decreased body balance, and the decreasing reaction. After age of 60, one's physical capacity will be decreased by 25%, characterized by the decrease of muscle strength, while sensory and motoric abilities are reduced by 60%.[5]

The decline in the elderly nervous system is characterized by the continuous death of the brain cells, start from age 50. This condition results in the lack of blood supply to the brain. The decrease of nerve conduction velocity is caused by the degeneration of nerve's ability to convey impulses from and to the brain, sensory sensitivity, and skin sensitivity[5].

The decrease of muscle strength in the elderly includes: the decrease of the hand muscle strength (16-40)%, varied depends on one's level of physical fitness. Hand grip strength decreases by 50%, and arm muscle strength decreases by 50%. The strength and movement in the elderly's body declines due to the decreased function of the motoric organs function, stumulus, sensory organs, the motor neurones, the level of physical fitness (VO2max), and muscle contraction. The lower thigh muscle weakens faster than muscles of the hand. Arm muscles will be more intensively used than leg muscles[6].

The Streng. and movement in the elderly's body declines due to the decreased function of the motoric organs function, stumulus, sensory organs, the motor neurones, the level of physical fitness (VO2max), and muscle contraction. The lower thigh muscle weakens faster than muscles of the hand. Arm muscles will be more intensively used than leg muscles[6].

The decreased gestures so that elderly often have accident while doing their activity. The decrease of body coordination will disturb the elderly in coordinating activity and 25% of the elderly had almost fallen (near miss) in the bathroom. Though, this condition is an early sign of the elderly's coordination control system degeneration and need to be watched. Degeneration process of the cartilage and muscle cause decreases

mobility and increases risk of injury. Therefore, the most important thing is the elderly's activity should not require muscular strength, endurance, speed, and flexibility. 50% of human's power is lost at the age of 65, but the strength of hand's muscle only decreases at 16%[6]

Anthropometric

Anthropometric measurements of height and weight then calculate the body mass index (BMI). BMI is calculated by dividing weight (in kilograms) by height squared (in square meters). Normal BMI for elderly woman is 17-23, whereas for elderly men is 18-25. The anthropometric measurement of height in the elderly men is often not precise due to height reduction caused by spinal compression, kyphosis and osteoporosis. For the height measurement, it is recommended to use knee height measurement to determine the exact height of a person. The knee height will not be reduced unless there is a fracture. BMI is useful as an indicator to determine the indication of KEK (Chronic Energy Deficiency) and overweight (obese)[2,3.]

Research Design

Type of the research design used is an experimental with treatment by subject design and 50 respondents from cadres in Denpasar Bali. Samples are given two treatments, Pretest (sample using the old measurement facility) and Posttest (sample using the new design height measurement of knee ergonomic tools). Knowledge and skills improvement is measured by using pre-post test questionnaire and tools. The data were analyzed using t test with significance level of 5%.

RESULTS AND DISCUSSION

Subjects of this research were 50 elderly cadres of health centre Denpasar, with 49 of the cadres having high school education level and 1 cadre has Bachelor degree. Cadres of the health center should get information through anthropometric training. Cadres should be informed that physical changes occur in the elderly, and they are not able to stand for a long time. Therefore, they need to do knee height measurement to find out the body height. Ergonomic knee height measurement is really helpful to provide reliable results by avoiding injury and fatigue to the elderly and helping the cadres to work naturally without bowing and reducing inclination. The measurement uses left knee, an exception to the elderly with left foot disabilities. Chumlea formula that is used to calculate the measurement is; for women: Height = 75.00 + (1.91 x Knee Height) - (0.17 x age) and for men: Height = 59.01 + (2.08 x Knee Height). To measure the body mass index in the elderly, first should be found out the anthropometric height[7].

Table 1: Knowledge and skills of the Health Centre Cadres Regarding Anthropometry

Variable			P
Knowledge	Pre test	18.69	0.000
	Post test	43,05	
Skill of Tools Usage	Pre test	14,18	0.000
	Post test	34,54	

Based on the analysis, the average knowledge of the health centre cadre regarding anthropometric measurements can be concluded. There are differences in knowledge before and after the training, in which there is an increase of 24.36 with a probability value ($p < 0.000$). There is an increase of 20.36 for the skill of using Anthropometric tools, with a probability value ($p < 0.000$). Cadres of the health centre provide service to the elderly in the community, and pay attention to the early health of the elderly through their nutritional status, knowledge about character, capacity, and limitations of the elderly. Ergonomics measurement tools are required for knee height anthropometric to find out the elderly's height[8]. Physical limitations of the elderly often require an ergonomist to look for the other techniques to achieve the goal, such as figuring out how to get the height anthropometry of the elderly since the elderly's physical condition inhibits them from long standing[9]. The purpose of the Special for Elderly application are: (1) to improve physical and mental welfare, particularly to optimize the elderly's safety and health by preventing illness, reducing both physical and mental burden; (2) to increase social welfare by improving the quality of social contacts, managing and optimizing the comfort and accessibility aspects to a high quality of life[10,12,13].

CONCLUTIONS

Elderly require special treatment due to a decrease in physiological capabilities. Cadres of elderly health centre have a major role to determine the nutritional status of elderly in the community. Cadres should be

given the introductory knowledge and skills to use anthropometric tools to determine nutritional status as a preventive effort. Cadres training conducted in Denpasar Bali provided them knowledge. Skill training in using knee high anthropometry is proven to increase knowledge and skills in determining the nutritional status of the elderly.

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Identification of Microbes, Chemical, and Organoleptic Characteristics towards *Teh Wong* during Fermentation

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ABSTRACT

Teh wong is fermented of sweetened tea water using a starter of *tuak wong*. If *tuak* was left for six months will form a clot that can be used as a starter in making *teh wong*. The present study was intended to determine the characteristics of microbes, chemicals, and organoleptic towards *teh wong*. Microbial characteristics were determined by TPC and Total BAL, with gram staining and catalase test. For chemical characteristics was at knowing pH, total acid, alcohol, and sugar content. Organoleptic qualities of *teh wong* with hedonic test and quality in taste and its flavor. This research was conducted with five treatment that was *teh wong* was saved for 0 days, 3 days, 6 days, 9 days, and 12 days. The study result was indicated that there was a significant difference in total bacteria and LAB. The study result was obtained on pH, acid total, alcohol, and sugar content showed most significantly different ($p<0,01$), and the organoleptic test was significantly different ($p<0,05$) and was favored by the panelists on the 9 days retention of *teh wong* with slightly sweet sour taste.

Keywords: *teh wong, fermentation duration, microbiology, chemistry, organoleptic.*

INTRODUCTION

Fermentation is defined as a gradual change by enzymes from some bacteria, yeasts, and fungi in the growth medium. The chemical changes fermentation included *e.g.,* milk acidification, starch decomposition, and sugar to alcohols and carbon dioxide, as well as the oxidation of organic nitrogen compounds[1]

Lactic Acid Bacteria (LAB) is a group of gram-positive bacteria, no spore, round or stem and can convert carbohydrates into lactic acid[2]. LAB has an essential role, almost all food, and beverage fermentation processes.

Balinese traditional drink is hereditarily made and consumed by the Balinese people *e.g., tuak, arak, brem*, and *teh wong*. *The wong* is one of Balinese traditional drink commonly consumed by the people in Guwang, Sukawati Gianyar. *Teh wong* (fungi tea) is made from sugar water (sweetened tea water) fermented by a starter from *tuak* fungi. Fungi *tuak* is living in water containing sugar to maintain its life and is usually kept in sweet tea water. This fermented water is consumed by using sweet tea water as the basic ingredient of fermentation. Then, the resulting water is called *teh wong* (fungi tea). The fermentation will convert sugar into alcohol. Thus, the bacteria will turn alcohol into acid. Then, the sweet tea water turns into a slightly sweet acid. *Teh wong* is usually consumed by the people in Guwang Sukawati as a drink.

MATERIALS AND METHOD

This research is an experimental research with an experimental design using *Randomized Block Design (RBD)*, five treatments and four replications, then organoleptic test. Acidity level (pH) with pH meter[3]. Total sugar with refractometer; alcohol level with alcoholmeter[4]; total acid content with titration; for LAB confirmation *i.e.,* isolates, catalase, and gram staining are performed. Microbe total calculates with Total Plate Count (TPC), Processing and analysis of the data with *Analisis Of Varians (Anova)*. If it is obtained different results will be followed by the *Least Square Difference (LSD)* test.

This research consists of five treatments, they are P1: fermentation period of *teh wong* for zero days,

P2: fermentation period of *teh wong* for three days, P3: fermentation period of *teh wong* for six days, P4: fermentation period of *teh wong* for nine days, P5: fermentation period of *teh wong* for 12 days.

Teh wong beverage procedure is: Three grams tea brewed in hot water about 1000 ml for three minutes then added 20% b/v stirred evenly until the sugar melted entirely; After the cold tea water with 30°C temperature (room temperature) then enter *nata wong* (fungi) as a starter; Then it is fermented according to treatment for 0 days, 3 days, 6 days, 9 days, 12 days; Then *teh wong* is conducted a microbial identification, chemical, and organoleptic test.

The organoleptic test is conducted by a panelist rather trained 30 people from the society in Guwang Sukawati who are familiar and used to consume *teh wong* with five hedonic scales.

RESULTS

Total microbial is expressed in *Total Plate Count (TPC)* on *teh wong* products. In the study, it is shown that total microbial in *teh wong* with fermentation period for zero to 12 days was 1.53 x 10^4 to 1.95 x 103 cfu/ml.

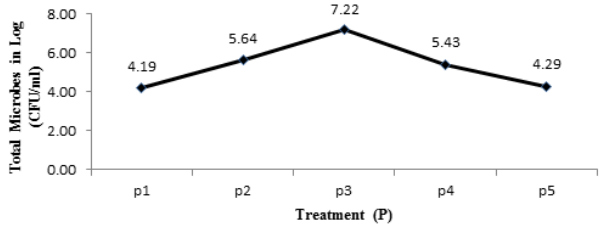

Figure 1.Total microbial of *teh wong* based on fermentation period

Figure 1. shows that the total bacteria increased from zero days (1.53 x 10^4 cfu/ml) to the fermentation period of *teh wong* in the 6th day is (1.64 x 10^7 cfu/ml). Then, a slight decrease at the end of the observation is fermentation for 9 days (2.66 x 10^5 cfu/ml) and 12 day (1.99 x 10^4 cfu/ml).

Total LAB on *teh wong* product showed that total LAB fermentation period for zero to 12 days is 5.92 x 10^3 to 2.86 x 10^6 cfu/ml.

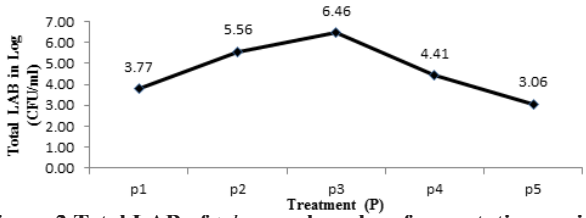

Figure 2.Total LAB of *teh wong* based on fermentation period

Figure 2. shows that the total bacteria increased from zero days (5.92 x 10^3 cfu/ml) to the fermentation period at the 6th day is (2.86 x 10^6 cfu/ml) then a slight decrease at the end of observation that is fermentation period at the 12th day (1.15 x 10^3 cfu/ml).

Acidity level (pH) towards *teh wong* based on fermentation period decreasing from pH 3.62 to pH 2.14 after 12 days fermentation.

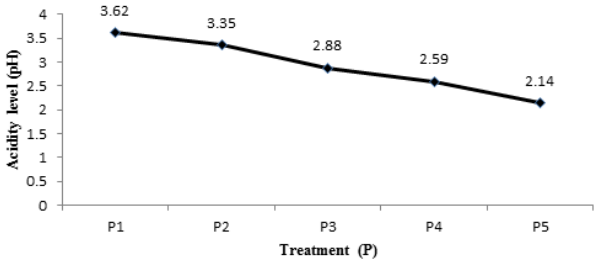

Figure 3. pH teh wong based on fermentation period

Total acid level for *teh wong* based on fermentation period increased from 0.18% to 0.50% after 12 days fermentation.

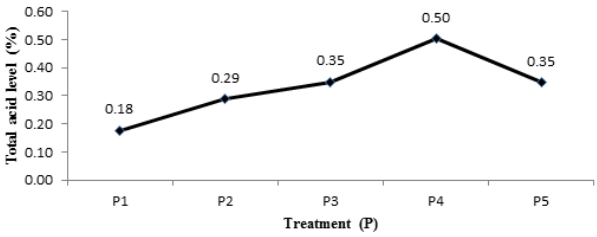

Figure 4. Total acid level of *teh wong*

Alcohol level towards *teh wong* based on fermentation period increase from 0% to 0.17 % after 9 days fermentation then decrease alcohol level to 0.13% after 12 days fermentation.

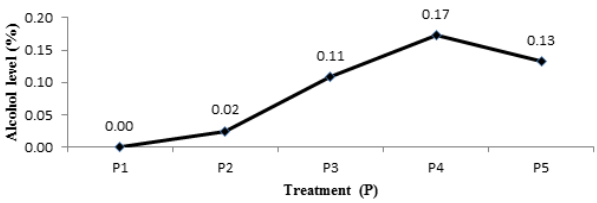

Figure 5. Alcohol level towards teh wong

Total sugar towards *teh wong* based on fermentation period decreased from 19.1%% to 1.35% after 12 days fermentation.

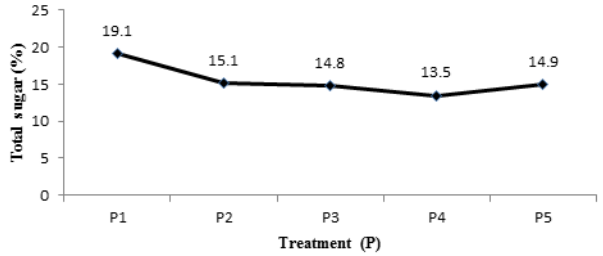

Figure 6.Total sugar towards *teh wong*

The organoleptic test for *teh wong* included flavor, flavor, and color as well as overall acceptance with a hedonic test with five hedonic scales and for hedonic quality on taste quality and flavor quality with three hedonic quality scale. Based on the analysis result regarding on organoleptic test variety for flavor, taste and color and acceptance in whole at *teh wong* that there is significan (P <0,01).

The research results of organoleptic test for *teh wong* with fermentation period 9 days (P4) is most favored by panelists, especially the overall acceptance of flavor and flavor, as well as supported by chemical analysis pH 2.59, total acid 0,50%, 0.17% and sugar level of 13.5% supported by total Lab 2.57 x 10^4 cfu/ml. For more details, *teh wong o*rganoleptic test with 5 fermentation treatments can be seen in Figure 7.

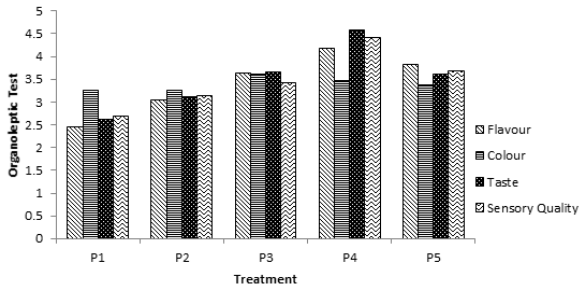

Figure 7. Organoleptic test of *teh wong*

DISCUSSION

Based on the research that is conducted, it is known that the long treatment of fermentation influences total microbial *i.e.,* TPC on zero-day (1.53 x 10^3 CFU/ml) and keeps increasing on the fermentation period to 6 (P3) is 1.64 x 10^7 CFU/ml) for fermentation time to 6 days (2.66 x 10^5 cfu/ml) and 12 days (P5). There is a slight decrease. On zero day fermentation, microbes still experience the phase of adaptation than on the fermentation period to 6 days is increasing due to this phase of microbial splitting rapidly influenced by the medium of growing places unlike nutrient content, pH, and environmental conditions as well as during the fermentation process and still occur has reached a static growth phase followed by a slight decrease in fermentation duration to 9 days and 12 days with phase to the end due to reduced substrate concentration, high population density, and toxic metabolism products *e.g.,* lactic acid, acetic acid, and propionate acids[5,6]. This is due to the influence of product viability, thus, due to the total bacteria amount to decrease on the fermentation period for 9 days.

LAB result is obtained that there is an increase until the fermentation period for 6 days (2.86 x 10^{6c} cfu/ml), then decreased on 9 days (2.57 x 10^4 cfu/ml), this is due to the high production of lactic acid and the decrease of pH environment to 2.59 during fermentation. The lactic acid level is an important factor in LAB viability due to the high production of lactic acid inhibits bacterial growth , stated that *the wong* fermentation for 7 days with a sugar concentration is 15% b/v with a pH value of 2.96, total acid 0.14% and total LAB 5.4 x 104 colony/ml. The main factors have decreased the viability of Lactobacillus strains is decreased pH of the media and accumulation of organic acids as a fermentation result[7-9].

The research result with Cat Gram identification is to produce positive Cat Gram in the form of basil, and this bacterium has negative catalase properties. However, there is some positive catalase. The negative LAB catalase test is taken from a clean white bulbous colon rather prominently at 10^{-1}, 10^{-2}, 10^{-3} dilution. In a negative catalase test on MRSA media with no air bubbles. If it is suspected to be H_2O_2 suspected lactic acid bacteria, this was supported by[10] opinion that stated a lactic acid bacteria is a negative bacterium producing catalase enzymes due to lactic acid bacteria is an anaerobic facultative bacterium that produces peroxidase enzymes that will break down H_2O_2 into organic compounds and H_2O, and not to produce air bubbles.

Acidity level (pH) is one of the intrinsic factors of food that can affect microbial growth. Based on research conducted, it is known that pH in each treatment more day is decreased. The lowest pH of *teh wong* is found in fermentation for 12 days and the highest in fermentation for 0 days (3.62). Microbes in one medium initially undergo a phase of adaptation with the substrate and environmental conditions. The change in pH is strongly influenced by microbial activity during the fermentation

process. The lowest pH on fermentation for 12 days and the highest on fermentation for 0 days this is due to the total microbial increased. Therefore, the substrate decomposition of the microbial sugar increased, especially into alcohol and CO_2, and metabolized further into organic acids, especially lactic acid. The total acid value is inversely proportional to pH value in the fermentation, the higher total acid value is the lower fermentation pH as well as vice versa. In the present study that the fermentation period of *teh wong* has an effect on total acid. Due to in the fermentation process will produce organic acids that cause the taste to be acidic. The fermentation period has an effect on the increase of the total acid level of *teh wong*. Due to at the time of fermentation will be produced organic acids [11].The formation of organic acids, unlike lactic acid in fermentation products based on the glucose breakdown into lactic acid. Lactic acid produced by LAB will be excreted out of cells and will accumulate in the fermentation fluid, thereby, increasing the total acid level[12,13.]

This is due to the activity of yeast in *teh wong* maximum P4 at optimum condition pH 3. In addition, the higher alcohol levels of beverages are also due to the starter used has the highest production capacity of alcohol at a certain optimum sugar concentration[14].

The addition of sugar level used in making *teh wong* concentration is 20% b/v with fermentation period has a significantly different effect on sugar level in *teh wong* drinking. The longer total sugar fermentation of *teh wong* has decreased. This is due to the microbes in the fermentation process will utilize sucrose through enzymatic and convert it to ethanol and acid[15].

A Taste regarding a range of dislikes to likes and *teh wong* who get the highest value is with 9 days fermentation for along as it is in accordance with the fermentation conducted generally in the society. During the fermentation period will change the nutrients components in *teh wong.* Therefore, the taste effect of *teh wong* flavors of sour *teh wong* is preferred and the sour taste is due to the bacteria that convert alcohol to acid. Lactic acid bacteria produce a number of lactic acids as the end result of carbohydrate metabolism, thereby, decreasing pH value of the growth sphere and causing a sour taste[5].

The acidic flavor is due to the fermentation of sugar into alcohol, which then the bacteria will turn alcohol into acid. The flavor of *teh wong* on zero-day fermentation is not acidic flavor. This is due to zero-day has not happened changes of nutrient components in tea solution that have not degraded by a microbe, therefore, the flavor is not acid (normal flavor of tea). Whereas the sixth fermentation has started with a rather acidic scent, this is due to the fermentation process resulted in the formation of alcohol and decreased pH and the other formation metabolites that will directly act as a precursor flavor in *teh wong*.

Teh wong color shows a brownish yellow. This is due to the tea used as a fermentation medium. The color of the brownish tea is due to the drying process in the manufacture of black tea leaves due to the enzyme phenolase. A tea color that plays a role in the formation of color and flavor typical of black tea is the change of caffeine compound into *the aflavin* and *thearubigin*[16]

Thus, the most preferred *teh wong* with for 9 days fermentation with an organoleptic test on flavor and flavor and supported by appropriate microbial and chemical characteristics and in accordance with other studies. In *teh wong* research for 9 days fermentation treatment, total microbial is 2,66 x 10^5 cfu/ml and total LAB is 2,57 x 10^4 cfu/ml with chemical analysis that is pH 2,59, total acid 0,50%. This is supported by the study[17,18] stated that *teh wong* fermented for 8 days with total microbial is 4.50 x 10^4 cfu/ml and total LAB 9.90 x 10^5 cfu/ml, for chemical characteristics pH 2.57 and total acid 0.13%.

CONCLUSIONS

Based on the results of data analysis and discussion, it can be concluded the research results as follows: 1) Microbiological characteristics of total microbes towards *teh wong* based on increasing TPC of zero fermentation day is 1.53 x 10^3 cfu/ml to fermentation for 6 days is 1.64 x 10^7 cfu/ml. Then, there is a slight decrease in P4 and P5 is 2.66 x 10^5 cfu/ml and 1.95 x10^4 cfu/ml. For LAB identification with positive Gram painting with negative catalase test. 2) Chemical characteristic is included pH, total acid, and alcohol level and in *teh wong* based on fermentation period is an increase from zero-day fermentation (P1) to 9 days (P4). Then, the decrease is its fermentation for 12 days (P5). For pH decrease until 12 days fermentation. 3) Organoleptic characteristics of *teh wong* based on different fermentation period on

organoleptic test on flavor, flavor, color, and Overall Acceptance (OA) is significantly different while for the quality of flavor and taste of *teh wong* is very real. 4) The most *teh wong* preferred characteristic is 9 days fermentation.

Conflict of Interest: All authors declare that there is no any conflict of interest within this research and publication including the final agreement.

Etichal Clearence: Ethical Clearance obtained from the university committee and respondent assignment.

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Effect of Education Health Wash Hands of Changes in Knowledge and Attitude of Women Taking Care of Children of Diarrhea in Hospital Wangaya Denpasar

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ABSTRACT

Diarrhea is a bowel movement with a liquid consistency (diarrhea) three times or more in a day or 24 hours, Diarrhea is one of the main causes of Increased morbidity and mortality for all age groups in the world, especially in developing countries and most experienced of children under five years of age. The purpose of this study was to Determine Whether there is the influence of hand washing health education to changes in knowledge and attitudes of mothers in caring for children with diarrhea. The study design used is the one group pretest-Post test with consecutive sampling techniques. Respondents used are mothers of children hospitalized with diarrhea by 53 respondents. Results of the study found no effect of health education on knowledge and attitude changes in the care of children with diarrhea mother with P-Value = alpha of 0:05. The Advice is given that the mother can apply to perform and teach children to wash Reviews their hands before and after meals. Suggestions to the hospital to continue to provide health education on the prevention of diarrhea to parents Whose children are hospitalized so that diarrhea can be prevented.

Keywords: *Health Education, Knowledge, Attitude, Diarrhea.*

INTRODUCTION

According to the Department of Health (2005), diarrhea is a disease with signs of the change in the shape and consistency of the stool into the liquid and the frequency of bowel movements more than 3 times a day or 24 hours[1]. In 2004 the World Health Organization (WHO) reported the State of Ethiopia including order 4 of the 15 countries that experienced the highest child mortality due to diarrheal illnesses that as many as 86 000 children[2]. The cause of diarrhea in children are a variety of bacteria, viruses, and parasites with symptoms of bowel movements three times or more the consistency of the stool liquid, and generally can kill children aged less than five years each year[3]. Diarrhea is one of the main causes increased morbidity and mortality for all age groups in the world, especially in developing countries and most experienced children under five years of age. Periods of diarrhea, in general, the world experienced by children under the age of five years is estimated at 1.7 billion and 36 million children have severe diarrhea cases and an estimated 700,000 deaths each year. State of Singapore as a developed country in 2011 there were 124 292 children under five years old have acute diarrhea and this is an increase of 10.3% compared to 2009.[4]

It is estimated that about 2.5 billion cases of diarrhea occur in children under the age of five every year. The incidence of diarrhea is generally relatively stable and most cases of diarrhea occur in Africa and South Asia [5]. Diarrhea is still a major health problem for the people of Indonesia because the morbidity and mortality of diarrhea is still high, as the results of a survey conducted Subdit Diarrhea Health Department from 2000 to 2010 was found in 2000 IR 301/1000 diarrheal disease population, in 2003 rose to 374/1000 population, 2006 rose to 423/1000 population and the population in 2010

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to 411/1000. Extraordinary events diarrhea is still often the case with CFR are still high, the 2008 outbreak in 69 districts with the number of cases of 8133 people, with a death rate 239 (CFR2,94%). In 2009 an outbreak in 24 districts by 5756 the number of cases with a mortality rate of 100 people (CFR 1.74%) and in 2010 an outbreak of diarrhea in 33 districts with the number of 4204 cases and 73 people who died (CFR 1.74%), when viewed per group aged children who have the highest prevalence of diarrhea are children under the age of 1-4 years is 16.7% and by gender prevalence in men and women almost equally, men 8.9% and women 9.1%. Based on household health survey (Survey) on mortality studies and basic health research over the years that diarrhea is a major cause of infant mortality in Indonesia[1].

Gastrointestinal diseases such as diarrhea in the province of Bali is still high enough to find. In 2014 the number of cases of diarrhea in Bali as many as 87 845 people and the number is increasing compared with the year 2013 the number of cases of diarrhea as many as 86 493 people. Cases of diarrhea were handled as many as 69 817 cases (79.5%) and diarrhea morbidity 214 per 1000 population. Pattern 10 diseases are treated in public hospitals that exist in the region of Bali province in 2014 cases of diarrhea ranks second after dengue fever by the number of diarrhea cases as many as 4,121 people[6].

Efforts to promote hand washing is now widely practiced in all countries so that people can improve their health status and children can be trained to wash hands to avoid the spread of diseases like diarrhea[7]. Health education hand washing is very important for people to understand the benefits of hand washing can reduce the incidence of diarrheal diseases and respiratory disease is the leading cause of death in children aged under 5 years, but the results were prove handwashing has been done community after being given intervention only 4 out of 30 respondents about 13% [8].

MATERIALS AND METHOD

Research design methods **One Group Pretest-Post test** to measure changes in knowledge and attitudes of mothers in the care of children with diarrhea study was conducted by means of one measurement before (pre-test) prior to their treatment and after it was measured again (post-test). The treatment will be carried out give health education on how to wash hands properly to the mother whose child was treated with diarrhea.

RESULTS

Table 1. Distribution of the characteristics of the study

Subjects Research Variables	n	%
The education level of the mother		
- Never schools	1	1.9
-No elementary school	1	1.9
-Graduated from elementary	4	7.5
- Graduated junior high school	11	20.8
- Graduated High School	27	50.9
- Bachelor	9	17
Occupation Mother		
-Mother Domestic	26	49
- Employee	15	28.3
- Teacher	2	3.8
- Health Officer	1	1.9
-Entrepreneur	9	17
Maternal age		
- 24-28 years	18	34
- 29-33 years	19	35.8
- 34-38 years	14	26.4
- 39-43 years	1	1.9
- 44-49 years	1	1.9

Based on Table 1 above characteristics of respondents by age group, most were in the age group 29-33 years of the 19 (35.8%). The education level of respondents is located mainly on the type of secondary school (high school) that 27 (50.9%). Based on the type of work the respondents are located mainly on the type of work housewives as many as 26 (49%).

Table 2. Analysis of dependent T Test knowledge before and after intervention

Based on table 2 above are found mean 6.698, the standard deviation of 3.820 and p-value = 0.000, it is no significant difference of knowledge of mothers before being given a health education intervention with after the given intervention because of the p-value obtained by <alpha (0.05).

Paired Samples Test

	Paired Differences					T	df	Sig. (2-tailed)
				95% Confidence Interval of the Difference				
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1 before-after	-6.69811	3.82092	.52484	-7.75129	-5.64494	-12.762	52	.000

Table 3. Analysis of Dependent T Test attitudes before and after the intervention

Paired Samples Test									
		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	before – after	-.88679	.12537 -1.13837		.91274	-.63521	-7 073	52	.000

3 According to the table above are found mean standard deviation 0.886 0.912 and p-value = 0.000, this is no significant difference before the mother's attitude given health education intervention after a given intervention, because of the p-value obtained by <alpha (0.05).

Table 4. Analysis of *Chi-Square* the capital of Education Knowledge awarded Measures Prior

Education	Knowledge						Total		*P Value*
	Low		Medium		High				
		N%		N%		N%		N%	
Secondary Education	4	22	13	72	1	5.6	18	100.0	0.301
Higher	2	5,72	27	77.14	6	17.14	35	100.0	
Amount	6	11.32	40	75.47	7	13.21	53	100.0	

Based on table 4 above are found most mothers have a moderate knowledge of higher educational backgrounds as many as 27 respondents (77.14%), with

P-Value = 0.301.

Table 5. Analysis *Chi-Square* Mom with Attitude Education awarded Measures Prior

Education	Knowledge				Total		*P Value*
	No Good		Good				
		N%		N%		N%	
Secondary Education			17	100,0	17	100,0	0.128
Higher Education	2	7.4	34	92.6	36	100.0	
Amount	2	7.4	51	92.6	53	100.0	

based on table 5 above are found mostly mother's attitude before the given actions by a level of education that are in categories with higher education levels as many as 34 respondents (92.6%), P-Value = 0.128.

Table 6. Classification of Knowledge Levels Before and After Intervention

Classification Knowledge	Knowledge Pre		Knowledge Post	
		N%		N%
Less than	6	11.3	1	1.9
Average	40	75.5	8	15.1
Good	7	13.2	44	83
Amount	53	100	53	100

Table 7. Classification attitude Before and After Intervention

Classification attitude	Attitude Pre		Attitude Post	
		N%		N%
Less Good	6	11.3	1	1.9
Good	7	13.2	44	83
Amount	53	100	53	100

DISCUSSION

According to the research found that there is significant influence between knowledge and attitudes of mothers before and after health education intervention by washing hands with Value = 0.00 p-value of <value alpha = 0.05 for the level of knowledge and attitude of mother, The results of this study are supported by research conducted by Koffi with the goal of research is children between the ages of 9-14 years as many as 106 children by using cartoon animation FGD method to provide health education about abdominal pain or diarrhea. Most children or 68% understand and believe that the cause of abdominal pain or diarrhea is due, not clean of parasites because they do not wash their hands before and after meals[9]. Awareness for workers in institutional food makers about the importance of hygiene procedures is very precise because the workforce is hand hygiene can serve as a vector in the spread of bacteria in food. Wash hands properly carried out can significantly reduce the incidence of diarrhea and other gastrointestinal diseases[10].

Research conducted to respondents provide free soap and given health education on how to make hand washing a bigger influence. An increase in compliance hand washing before eating, cooking, after visiting the toilet or cleaning a baby[11]. Research conducted at the household to children in Mirzapur found as many as 51.3% of cases and 51.7% of group control group using soap or detergent to wash hands[12].

Based on the results of the study found the majority of knowledge of mothers before being given intervention at the level of general education secondary school is 21 respondents with moderate knowledge level. Results of research conducted Hashi found health education on how to wash your hands with soap and education about health can influence behavior change to reduce the incidence of diarrhea[13]. Communities with low education, low socioeconomic status and access to clean water sources are limited facilities and the availability of soap minimal so that health education programs, especially how to wash hands properly needs to be done. Health education about hand washing can be done in various places such as schools, hospitals, public or mass media campaigns in order for the public hand washing can be done with self-consciousness[14]. Families generally have little knowledge about the causes of diarrhea. Knowledge of the family has a significant relationship with their exposure to water and sanitation. The level of knowledge is low on cleanliness noted in studies conducted in Ethiopia, Nigeria, and Tanzania. The incidence of diarrhea in infants as much as 6.1% in Mkuranga and the incidence of diarrhea is similar to that reported in India. The low

incidence of diarrhea in Mkuranga can occur because the study subjects were interviewed is the head of the household is not the mother or caregiver toddlers[15,16.]

CONCLUSION

Most of the level of knowledge of the mother before being given a health education intervention washing hands is the medium category is 40 respondents and the attitude of the mother before being given interventions including good category were 51 respondents.

Most of the level of knowledge of the mother after being given a health education intervention washing hands is categorized as high as 44 respondents and the attitude of the mother before the given intervention included good category were 53 respondents

There is a significant relationship between the level of education and mother's attitude before and after health education intervention washing hands with p-value = 0,00<alpha value of p = 0.05

Conflict of Interests: The authors declare that they have no competing interests.

Ethical Clearance: Ethical clearance was obtained from the board of ethics committee of Wangaya Denpasar Regional Hospital and respondent's approval

Source of Funding: Indonesian Ministry Of Health

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The Analysis of Fecal Coliforms and Coliform Total in Wells Water at the Tourism Area of Sanur

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ABSTRACT

Sanur is a tourism area that located in the south of Denpasar, which includes the village of Sanur, SanurKaja, SanurKauh, and Renon, with clean water wells facilities as many as 3174 wells. Utilization of water wells in this region 87% of the total existing wells. Based on quality measurement results conducted by the DinasKesehatan Kota Denpasar in 2006, from 40 dug-wells in South Denpasar District, the content of Coliform and fecal coli has exceeded water quality standards which refers to Permenkes No. 416/ Menkes/ Per/IX/1990, it can be concluded as a high risk of contamination status.

This research was cross sectional study then followed by analyzing the degree of contamination of fecal coliform and total coliform. Data were obtained from interviews, observations, measurements and laboratory tests. Data have been collected and analyzed by Chi Square test.

Chi square analysis showed that all independent variables was highly significant and relates very significant (sig<0.5), except for the depth of the water wells that are insignificant to contamination coli fecal (sig >0.05).

To reduce cases or incidents of water-borne disease, local authorities are advised to provide financial assistance to improve the poor well construction and environmental sanitation education held periodically every three months. In addition, chlorination of water wells in the region are also important to reduce the incidence of disease caused by contaminated water by a group of indicator bacteria (coliform and fecal coli).

Keywords: *fecal coliform, total coliform, well water*

INTRODUCTION

Urban people still tend to use well water (other than piped water from PDAM) for everyday purposes. The well water is one of the most common sources of water and is very widely used by small communities and residential neighborhoods. Well water comes from an aquifer that is relatively close to the surface of the ground so easily contaminated. This often occurs when well made does not meet the requirements of layout and construction[1,2].

Sanur is a tourism area that located in the south of Denpasar, which includes the village of Sanur, SanurKaja, SanurKauh, and Renon, with clean water facilities such as wells as many as 3174 units (38.6% of the existed amount of clean water). Utilization of water wells in the region of 87% of the total existing wells[3].

The laboratory tests of water wells conducted by the City Health Office Denpasar in 2006 against 40 dg-wells in South Denpasar District , the content of fecal coliform and total coliform has exceeded water quality standards which refers to Permenkes No. 416/Menkes/ Per/IX/1990 , with a high risk of contamination status . Thus, the existing wells in the area of South Denpasar is technically not feasible as clean water resources[3]. This is confirmed by the study of Trisnawulan states that the total coliform water wells in the village of Sanur between 150/100 ml to 4600/100 ml.

Based on initial survey of 50 wells in the region Puskesmas II South Denpasar on the utilization of DSDP ie 90 % of people already use means DSDP. Data

behavior results showed that 42 % of respondents had a very good behavior, 40 % good, 8 % is quite good, and 10 % unfavorable. Based on the above, the present study was made in order to determine the level of contamination of coliform fecal and coliform total well water in terms of the utilization of the DSDP people's behavior, the condition of the construction of wells and the depth of the water table wells in the tourist area of Sanur.

MATERIALS AND METHOD

This study is descriptive with cross sectional that analyzes the variables, and there is no treatment of the variables studied, and only a measurement of the variables studied, with the aim to analyze the level of contamination Coliform feces and total coliform well water with the use of the DSDP, people's behavior, construction conditions dug wells , and the depth of the water table wells in the area of Sanur Tourism[3]. The data used is primary data, the data obtained from the results of bacteriological examination, utilization of DSDP, people's behavior, the condition of the well construction , and the measurement results supporting parameters (BOD5 , pH , and temperature of the water) as well as secondary data obtained from the data of geography, demography and annual reports Puskesmas.

While determining the location of sampling points in each village /sub done by random sampling with lottery technique[4].

RESULTS

Utility of DSDP

The survey of 60 families, 50 families has found a means using one provided by DSDP And as many as 10 families yet to utilize the facilities. The complete data can be seen in Table 1.

Table 1. Grouping of family which used of DSDP

No	Description	Subdsitrict				Total	%
		Sanur	Sanurkaja	SanurKauh	Renon		
1	Use of DSDP	12	16	18	4	50	83
2	Not yet use of DSDP	2	3	4	1	10	17
	Total	**14**	**19**	**22**	**5**	**60**	**100**

Assessment of the behavior of the user community wells

Assessment of the behavior of the user community dug well can be drawn that there are 15 users (25%) had good behavior, 30 people (50 %) to behave reasonably, and 15 (25 %) behaves less. Data can be seen in Table 2.

Table 2. Dug wells grouping by user behavior

No	Description	Subdistrict				Total	%
		Sanur	Sanurkaja	SanurKauh	Renon		
1	Good	5	4	5	1	15	25
2	Enough	6	11	10	3	30	50
3	Bad	3	4	7	1	15	25
	Total	**14**	**19**	**22**	**5**	**60**	**100**

The condition of the construction of dug wells

Based on the results of the field survey of the 60 wells dug obtained raw data 18 pieces of wells (30%) to the category of construction conditions well , 19 dug-wells (32%) to the category of construction conditions moderate, and 23 pieces of wells (38%) with less construction condition category. Data assessment dug well construction conditions can be specified for each village according to the location of the study (Table 3).

Table 3. Dug wells grouping by construction condition's categories

No	Description	Subdistrict				Total	%
		Sanur	SanurKaja	SanurKauh	Renon		
1	Good	7	5	5	1	18	30
2	Average	2	8	7	2	19	32
3	Bad	5	6	10	2	23	38
	Total	**14**	**19**	**22**	**5**	**60**	**100**

Measuring the depth of water table wells

Of the 60 wells were measured depth of face water , 18 units wells (30 %) belongs to the category of qualified (having a depth of water table wells ≥ 3 m and the remaining 42 wells dug (70 %) categorized as ineligible with depth < 3 m (Table 4) .

Table 4. Dug wells grouping by wells drilling depth and total coliform bacteria

No	Criteria (wells drilling depth)	Subdistrict				Total	%
		Sanur	SanurKaja	SanurKauh	Renon		
1	Qualified	4	8	5	1	18	30
2	Not qualified	10	11	17	4	42	70
	Total	**14**	**19**	**22**	**5**	**60**	**100**

No	Criteria (total coliform bacteria)	Subdistrict				Total	%
		Sanur	SanurKaja	SanurKauh	Renon		
1	Qualified	10	17	17	4	48	80
2	Not qualified	4	2	5	1	12	20
	Total	14	19	22	5	60	100

Of the 60 wells dug studied to determine the content of coliform bacteria by MPN method found as many as 48 pieces of wells (80 %) the water quality is qualified with the content coliformnya 0 per 100 ml and 12 pieces of wells (20 %) content of coliform exceeded standards quality standard (ranging from 3/100 ml to 93/10 ml). Data can be seen in Table 4 above.

5. The content of fecal coli bacteria

Of the 60 wells dug studied to determine the content of fecal coli bacteria found 55 pieces of wells (92 %) were eligible and 5 wells (8 %) who are not eligible to have content that fecal coli ranged from 3/100 ml to 4/100 ml (Table 5).

Table 5. Dug wells grouping by E. coli in Feces

No	Criteria	Subdistrict				Total	%
		Sanur	SanurKaja	SanurKauh	Renon		
1	Qualified	12	18	20	5	55	92
2	Not qualified	2	1	2	0	5	8
	Total	**14**	**19**	**22**	**5**	**60**	**100**

Parameter support

BOD5 water wells

The measurement results BOD5 showed 13 units wells (22%) contaminated with the value of BOD5 greater than the water quality standard Class I (Regulation of the Governor of Bali No. 8 of 2007) of 2 ppm and 47 pieces of wells (78 %) with a value of BOD5 qualify which is less than the standard value (Table 6).

Table 6. Grouping of Dug wells by BOD's content

No	Category	Subdistrict				Total	%
		Sanur	SanurKaja	SanurKauh	Renon		
1	Polluted	4	3	5	1	13	22
2	Not polluted	10	16	17	4	47	78
	Total	**14**	**19**	**22**	**5**	**60**	**100**

pH of water wells and Temperature

Results of pH measurement of water wells in the location study showed that the pH of the water wells ranged from 6.0 to 9.6. Based PERMENKES No: 492/ Menkes/Per/IV in 2010 there were 17 pieces of wells (28 %) with a pH value of water outside the standard range (6,5- 8,5) and 43 pieces of wells 72 %) with a pH value water ranged from 6.5 to 8.5 Table 7.

Table 7. Grouping of Dug wells by pH and Temperature of the water wells

No	Criteria (pH)	Subdistrict				Total	%
		Sanur	SanurKaja	SanurKauh	Renon		
1	Out of range	3	6	7	1	17	28
2	In the range	11	13	15	4	43	72
	Total	**14**	**19**	**22**	**5**	**60**	**100**

No	Kategori (Temperature)	Subdsitrict				Total	%
		Sanur	SanurKaja	SanurKauh	Renon		
1	Out of range	0	0	0	0	0	0
2	In the range	14	19	22	5	60	100
	Total	**14**	**19**	**22**	**5**	**60**	**100**

The temperature of the water all the wells is in the range 25-280C and qualify as defined by PERMENKES: 492/Menkes/Per/IV/2010 (± 30°C when compared to the air temperature). Data can be seen in Table 9.

Correlation with the content of DSDP Utilization Coliform and fecal coli

The results showed level of contamination by coliform by 20 % and coli feces of 8% on the wells in the region Puskesmas II South Denpasar, thought to be caused by the transfer of the management of household waste from the septic system tank to the means DSDP also contribute substantially to the value of contamination of coliform and fecal coli in most wells in the study area. We have recorded 83 % of the people in Sanur travel kaasan who already take advantage of this DSDP means to manage waste.

The analysis showed that the presence of DSDP was highly significant $p< 0.05$) on the level of contamination of well water in the tourist area of Sanur. According to Mallongi,et.,al[6] integrated waste management, as practiced by the DSDP can reduce the level of contamination in water bodies significantly.

Dug wells User Behavior Correlations with the content of Coliform and fecal coli

The analysis showed that the behavior of the user community wells are closely related to the content of coliform and fecal coli ($p < 0.05$). This means that hygienic behavior in using wells will have a positive impact on the quality of water in these wells. Behavior reflecting sanitary conditions in the local communities. Poor sanitation is a major cause of groundwater pollution, which generally occurs in dense residential areas[7,8].

Behavioral assessment wells user community includes providing the infrastructure readiness wells, dug wells to maintain the cleanliness of facilities, maintenance of facilities wells and utilization of facilities provided as well as actions taken when there is a problem. According to the theory in the book Notoatmojo Lawrence Green[9], the health behavior of individuals and or communities are influenced by factors beyond the behavior and conduct. Behavioral factors include knowledge, skills, attitudes, beliefs, cultures, social norms , and other forms contained within the individual/society. While factors beyond behaviors include infrastructure, ease of reaching the means, the legislation, and the ability to assess the previous extension.

Correlation Depth Dug Well Water Front with the content of Coliform and fecal coli

Unlike the case with the construction of wells conditions, depth of water table wells are not related to the content of coliform in water wells (Table 11). Face water wells near the soil surface has the properties are particularly vulnerable to contamination, both biological or other contamination. Bacteriological contamination vertically up to 3 m and a horizontal reach of 11 m.

Coliform bacteria found in the water wells categorized depth of water table wells are not eligible at all locations, both in the village of SanurKaja, SanurKauh, Sanur village, and village Renon. While fecal coli bacteria found in the water wells categorized depth of water table wells are not eligible at three locations , namely in the village of SanurKauh, Sanur village, and the village of SanurKaja. The analysis showed no association with the well depth of water table contamination with coliform and fecal coli contamination.

Temperature, pH, and DO is optimal for the growth of coliform group of bacteria also support the proliferation of bacteria in the water. The measurement results indicate that some of the parameters of supporting as many as 22% of the samples examined showed BOD5 values that exceed the standards allowed by Bali Governor Regulation No. 8 of 2007 (> 2 ppm). BOD5 high value indicates a high content of biodegradable organic materials in the water system.

The degree of acidity (pH) of water samples examined in the range between 6.0 and 9.6. Of the 60 samples tested, as many as 17 well water samples 28 %) have pH values outside the range specified by PERMENKES/492/Menkes/PER/IV/2010 (outside the range 6.5 to 8.5). The remaining 43 wells (72 %) have a pH value which is within the range as determined by the same rules. According Sanropie (1984), microorganisms generally grow well in the pH range between 6.0 and 8.0. The optimum pH range in water samples tend to be supported by the construction of wells that are less qualified will be a combination of mutual support the high level of contamination by bacteria pollutant indicators (coliform and *Escherichia coli*) in the water samples examined.

In addition to pH, temperature measurement results

also indicate the optimum range (25°C - 28°C) for the growth of the indicator bacteria for coliform and fecal coli[12.] Measuring water temperature is necessary because the temperature is a factor that affects the rate of chemical reactions in the water, gas solubility in water, and the growth of microbes which are generally in the range of 8°C - 46°C. High and low temperature of the water is affected by the physical processes that occur in the water or the air temperature around the water sources, such as solar radiation directly into the water[13,14].

CONCLUSIONS

Utilization of facilities DSDP in the tourist area of Sanur related highly significant (sig < 0.0) with the content of coliform and fecal coli.

Conduct user community wells in the tourist area of Sanur related highly significant (sig < 0.05) with the content of coliform and fecal coli.

Condition dug well construction in the tourist area of Sanur relate very significant (sig < 0.05) with the content of coliform and fecal coli.

The depth of the water table wells in the area of the health center II South Denpasar related highly significant (sig < 0.05) with coliform content of unrelated but significant (sig > 0.05) containing fecal coli.

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Mother Class Program Enhancing Capability of Mother to Provide Stimulating the Development of Children at Dawan Village Bali

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ABSTRACT

Mother Class program is a class that mothers who have children aged between 0-5 years with the same discussion, brainstorming, and exchange of experience will be the fulfillment of health care, nutrition, and stimulation of growth and development. The aims of this study were to determine the effect of Mother Class program to Increase the ability of mother providing stimulation and development of infants. This study used a quasi-experimental design approach pretest-posttest control group design. The total samples of 48 toddlers were divided into 2 groups and technique of sampling with purposive sampling technique. The intervention group received education about developmental stimulation and stimulation modules, but the control group only follow post-service activities only. Data analysis using the Mann-Whitney test and the Wilcoxon the signed-ranks test. The results showed there was a difference in the ability of the mother to stimulate the development between the control group and the intervention group after the implementation of the Mother Class program (p-value $<\alpha = 0, 05$). It is recommended that the Mother Class carried out routinely follow a schedule of post service.

Keywords; *Mother Class, Mother Capability, Development Stimulation*

INTRODUCTION

Reduce child mortality is one of the objectives of Sustainable Development Goals (SDGs), which could be achieved if the access to and quality of child health services implemented optimally. To the accelerated efforts together to improve access and quality of child health services need to be implemented. Child health program managers are expected to know and understand about effective intervention in achieving the SDGs.

The importance of stimulation and care of children, aged under three years, has become especially critical as more children survive and their quality of life becomes a concern[1]. One of the efforts of enhancing child survival is launching a community-based program that is class mothers. Mother class program is not a new program, the program in conjunction with the implementation classes for pregnant mothers and mothers-class is a continuation of the class of pregnant women.

Mother class program is a class where mothers who have children between 0-5 years old with same discussion, brainstorming, and exchange of experience will be the fulfillment of health care, nutrition, and stimulation of growth and development. Seeing the importance of mothers class program in order to enhance the empowerment of mothers through increased knowledge, attitude, and skills of a toddler care. To improve the ability of mothers in the care of good toddler mothers then organized classes in order to improve the knowledge, attitudes, and skills of mothers about infant care. Impact of this empowerment is increasing the health status of children under five[2].

Based on the health profile report of Bali in 2014, has been explained about the outcome of the healthcare service of children under five. Children under five years

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old health services are health care for children aged 12-59 months according to the standard include monitoring the growth of at least 8 times a year, monitoring the development of at least 2 times a year, and Vitamin A 2 times a year (February and August). In 2014 the health care coverage of children under five reached 86.91% increase compared to the year 2013 by 81.3%, this achievement has been passed target of the strategic plan of Ministry of Health in 2014, namely 85%. Only three districts that have not reached the target, that are Buleleng, Karangasem, and Klungkung[3].

The results of a preliminary study in post service at Dawan village, enforcement post service only focused on the child's weight and supplementary feeding for children under five years old. Some mothers that are asked randomly describe lack understanding about stimulation of growth and development of children in this area are dubious and experiencing divergence. Healthcare mother and child book saved by a cadre fearing which reason afraid that book will be lost. In that book, there is also much information about health record of the children. These fears are certainly justified and that solutions require information regarding health care, nutrition, and stimulation of growth and development of children can still be obtained, parent or caregiver. So to Optimization of mother class program need pocked books that interesting and can be brought by parent or caregiver might be able to answer these problems.

MATERIALS AND METHOD

This study used a quasi-experimental design approach pretest-posttest control group design. Total sample of 48 infants who were divided into 2 groups and techniques of sampling with purposive sampling technique. The intervention group received education about developmental stimulation and stimulation module, while the control group only follow post services activities only. Analysis of the data using Mann-Whitney test and Wilcoxon signed-ranks test.

RESULTS

The average age of the mother was 30 years old, with most of the mother's education level in secondary education with work mostly housewives.

Table 1. Distribution of Knowledge, Attitudes and Skills of mother for giving Growth Stimulation Before intervention mother class program

Variable	Intervention (n = 24)		Control (n = 24)	
		f%		f%
Knowledge of				
Good	3	12.5	8	33 , 3
Less than	21	87.5	16	66.7
Attitude				
Positive	10	41.7	12	50
Negative	14	58.3	12	50
Skills				
Good	10	41.7	5	20.8
Less	14	58.3	19	79.2
Capability				
Share ability	6	25	7	30.3
Less than	18	75	17	66.7

Before the implementation mother class program, the proportion of mother who has a good knowledge is 12.5% in the intervention group and 33.3% in the control group.

The proportion of mothers who have a positive attitude of 41.7% in the intervention group and 50% in the control group. The proportion of mothers who have good skills of 41.7% in the intervention group and 20.8% in the control group. The ability of mothers identified from the category of knowledge, attitudes, and skills of mothers giving stimulation. The analysis showed 25% of mothers are able to provide stimulation in the intervention group, whereas the control group 30.3% of women who are able to provide stimulation.

Table 2. Distribution Category Knowledge, Attitude, Skills and Capabilities Mother Toddlers Giving Growth Stimulation After Implementation mother class program

Variable	Intervention (n = 24)		Control (n = 24)	
		f%		f%
Knowledge of				
Good	20	83.3	13	54 , 2
Less	4	16.7	11	45.8
Attitude				

Cont... **Table 2.**

Positive	11	45.8	12	50
Negative	13	54.2	12	50
Skills				
Good	20	83.3	12	50
Less	4	16.7	12	50
Capability				
Share ability	20	83.3	12	50
Less	4	16.7	12	50

After the implementation of mother class program shows the proportion of mothers who have a good knowledge of 83.3% in the intervention group and 54.2% in the control group.

The proportion of mothers who have a positive attitude of 45.8% in the intervention group and 50% in the control group. The proportion of mothers who have good skills of 83.3% in the intervention group and 50% in the control group. The ability of mothers identified from the category of knowledge, attitudes, and skills of mothers giving stimulation. The analysis showed after mother class program implementation 83.3% of the mothers were able to provide stimulation in the intervention group, whereas the control group 50% of the mothers were able to provide stimulation.

Differences in Knowledge, Attitude, Skills, and Ability of Mother for Giving Growth Stimulation Between Control Groups And Intervention groups After mother class program Implementation can be seen in the following table:

Table 3. Differences in Knowledge, Attitude, Skills and Ability of Mother for Giving Growth Stimulation Between Control Groups And Intervention After mother class program Implementation

Knowledge	**Intervention group**		**Control group**		**total**		***p Value***
		%		f%		f%	
Good	20	83.3	4	16.7	24	100	
Less	13	54.2	11	45.8	24	100	0,031 *
Attitude	Intervention group		Control group		**total**		***p Value***
		f%		f%		f%	
Positive	11	45.8	13	54.2	24	100	
Negative	12	50	12	50	24	100	0.775
Skills	**Intervention group**		**Control group**		**total**		***p Value***
		f%		f%		f%	
Good	20	83.3	4	16.7	24	100	
Less	19	79.2	12	50	24	100	0,015 *
Capability	**Intervention group**		**Control group**		**Total**		***p Value***
		f%		f%		f%	
Able	20	83.3	4	16.7	24	100	
Less able	12	50	12	50	24	100	0,015 *

* Meaningful at $\alpha = 0.05$

Table 3 shows no difference in knowledge and skills of the mother after the implementation of the mother class program between the intervention and control groups (p-value $<\alpha = 0.05$). However, no differences were found between the attitude of the intervention group and the control group after the implementation of mother class program (p-value = $0.015 > \alpha = 0.05$). The ability of mothers was identified from these three aspects showed a difference between the control group and the intervention group after the implementation of mother class program (p-value = $0.015 < \alpha = 0.05$).

DISCUSSION

The average age of mothers in the control group was 29.50 while in the intervention group were older than control group is 30.88 years. In the intervention group, most mothers have the secondary education is 66.7% and largely as a housewife. In the control group, the majority of mothers have the secondary education (70.8%) and mostly as a housewife.

The housewife should be stimulating better because they have more time with the children. However, if knowledge of the possibility of giving inadequate stimulation will not be optimal. The behavior patterns of new and growing ability of a person occur through certain stages, beginning with the formation of knowledge, attitude until it has a new skill or behavior patterns of new[4].

Education needs to be identified to ensure that the groups will be compared in this study are similar or homogeneous, The level of education to be important to be identified or considered as the level of education can affect a person's knowledge. If the education level of respondents who researched significantly different, then it can affect the results of research, higher education groups would have better knowledge compared to a lower level of education.

According to the growth and development of children who either cannot be separated from the mother's level of knowledge of the mother is good. Knowledge can be obtained through education, both formal and non-formal. Knowledge obtained through various media. Research on the relationship with the knowledge level of formal education has been studied by Nuzuliana. The study concluded there was a significant relationship with the formal education level of mothers' knowledge of Pap smear ($p = 0.000$; $r = 0.616$). The higher the education level of the mother, then the mother's knowledge is also getting better.

Before the implementation of mother class program, the proportion of women who have a good knowledge of 12.5% in the intervention group and 33.3% in the control group. The proportion of mothers who have a positive attitude of 41.7% in the intervention group and 50% in the control group. The proportion of mothers who have good skills of 41.7% in the intervention group and 20.8% in the control group. The ability of mothers identified from the category of knowledge, attitudes, and skills of mothers giving stimulation, showed 25% of mothers are able to provide stimulation in the intervention group, whereas the control group 30.3% of the mother who is able to provide stimulation.

Before the implementation of mother class program seen that knowledge, attitudes, skills, and abilities mother only a small portion of the category of good in both groups. This may be due to information obtained stimulation is not adequate. Knowledge of the less stimulation will certainly impact the lack of ability of the mother or the mother's behavior in providing stimulation to their children.

The results are consistent with the research of Yusup which stated that the level of knowledge of the mother before being given health education with modeling approach shows that respondents are knowledgeable both the 30 respondents (30.3%), and knowledgeable about the 69 respondents (69.7%). This shows that most respondents do not understand very well about infant growth stimulation 0-6 months[5].

The child will learn various skills and develops concepts by interacting with the family. Parent's attitudes, behaviors, and relationships all determine the child's personality and subsequent behavioral patterns[6].

According to Roger[7], people will change behavior through several stages. These stages are starting to realize their individual stimulus, intrigued by the stimulus, think and consider the stimulus, began to try new behaviors and use new behavior. New behavior adopted by individuals will not last long and lasting if the individual receives such behavior with full consciousness and is based on a clear knowledge and belief.

The results showed there is difference in the ability of the mother to stimulate the development of the group

that followed mother class program but no difference in the ability of the mother in providing stimulation to the group that did not follow the mother class program. This research in line with the research conducted by Syamsu Maternal knowledge in the stimulation of toddler child development after the intervention found that there was a significant difference between maternal-educated women in the intervention group and mothers who did not receive health education in the control group in the developmental stimulation of toddler children at post-test in the intervention and control group Value = 0,000.[8]

The results are consistent with the research of Silvia that found the subjects did not have sufficient information to ensure the prevention of accidents in childhood before the educational intervention. By analyzing the mothers' knowledge before and after the educational intervention, there is an increase in percentage related to their knowledge compared to the step before the intervention. Therefore, it reaffirms the importance of regular implementation of educational health interventions on this topic in communities[9].

Mother class program held in a participatory means mothers are positioned not only receive the information for passive position tends to be ineffective in changing behavior. Therefore mother class program is designed with a participatory learning method, where the mother is not seen as a student but as people learn. In practice, women are encouraged to learn from the experience of others, while the facilitator acts as a steering to the right knowledge. Information on stimulation obtained in mother class program implementation, exchange experiences with other residents to learn which makes an increase in the knowledge that it will increase the mother's ability to provide stimulation. In mother class implementation, mothers also taught and given examples of games that can stimulate child development.

Some mother in the intervention group is a housewife so they have much time for their children. This is in line with Widajanti research that found there were significant differences in knowledge, attitude, and practice of under-five children stimulation between working and nonworking mothers. The knowledge of stimulation of the working mothers was worse than that of the nonworking mothers and the attitude and practice of the working mothers were better than those of the nonworking mothers[10]. Result consistent with research that there are relationships between family background factors (age of mother, education, family income and the number of children) and parenting knowledge, quality of stimulation in the home, and the child academic performance[11-13]

CONCLUSION

Before the implementation of mother class program, the knowledge, attitudes, skills, and abilities of mother to provide developmental stimulation are only a small part of the good categories in both groups.

There is a difference in the ability of mothers to provide developmental stimulation in groups that follow the mother Class program, but there is no difference in the ability of mothers to provide stimulation in groups that do not follow the mother Class program.

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Dengue Hemorrhagic Fever in the Highlands

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ABSTRACT

Dengue Hemorrhagic Fever (DHF) is a health problem for Indonesia, because it is a tropical disease, incidence of dengue hemorrhagic fever (DHF) in the highlands of Indonesia has not been widely reported. This study aims to provide an overview incidence of dengue in the highlands of South Sulawesi Tana Torajadistrict This study uses a case study design series with samples from patients with DHF were recorded in health centers in the period January 2012 to December 2015. The study found 390 cases, In 2015 there have been 106 cases. Most cases 47% in the district Makale with a height of 760 masl and the highest plateau that no cases of dengue in the district Bittuang with a height of 1425 masl number of dengue cases 4.4%. Most cases of male sex (52.83%), aged ≥ 15 years (63.20%), did not work / housewife (68.85%), mobility (76.41%), have knowledge good (54.72%), misbehave 66.03%), and has a reservoir of water (94.33%). The results of the examination by PCR in Ae. Aegypti in the study area contains positive dengue virus, dengue activity epidemiology investigation indicated sump wa likely dengue transmission has occurred in the highland region of Tana Toraja, South Sulawesi.

Keywords*: Dengue hemorrhagic fever, local transmission, Highland.*

INTRODUCTION

The physical environment includes geography, climate and water quality that affects the survival of the vector mosquito *Ae.aegypti*. In Indonesia, until recently, dengue remains one of the major public health problem. Dengue is a disease endemic urban areas. Since it was first discovered in 1968 in Surabaya and Jakarta, the number of dengue cases continue to increase in number and area were infected. Every year, sporadically always occurred Outbreaks in some areas[1].

This is done in the perspective of the dynamics of the ecosystem and risk factors among the districts / cities between provinces and between geography. In 2012 in Tana Toraja Regency recorded incidence of dengue in 2013, the year 2014 has been an outbreak of dengue fever in the number of cases as many as 157 people[2]. Tana Toraja is a plateau area and the tourism area. The topography of Tana Toraja district is mountainous with steep slopes an average slope of 25%, altitude 300 meter - 2500 meter, part of the lowest in the district and the highest part regencyBonggakaradengBittuang. Each problems and outbreaks of infectious disease. In particular, cases of DHF still tops the vector borne disease. Based on surveillance data Tana Toraja that the incidence of dengue is not there now is a disease a priority in the district, precisely in the District Makale (above the sea level = 760) Makale north ((above the sea level = 820), Sangalla (above the sea level = 817), rembon ((above the sea level=762) and Gandang Stone Sillanan (above the sea level = 980) for the last 4 years in cases of DHF.

The purpose of this study was to determine the characteristics of the incidence of dengue in the Highlands region of Tana Toraja is still not widely studied and reported, particularly about the characteristics of the patient and the potential for horizontal transmission of dengue fever in the highland region of the district.

MATERIALS AND METHOD

The study design used by the researchers is to describe a case series design variable person, place, and time on a bunch of people who suffer from the disease. This research was conducted in the District at the District Makale (above the sea level = 760) Makale north (above the sea level = 820), Sangalla (above the sea level = 817), Rembon (above the sea level= 762) and Gandang Stone Sillanan (above the sea level = 7620 for the last 4 years in cases of dengue research held at the end of the

period from January to July 2016. the study population was all confirmed cases of dengue fever were reported to the health center Makale, Makale north, Sangalla, Rembon and Gandang Stone Sillanan samples were all cases of dengue confirmed that having a complete medical record in the five health centers. Data is taken from dengue incidence data, the characteristics of DHF patients, the potential for horizontal transmission, and dengue epidemiology investigation activities conducted by the health center Tana Toraja district from 2012 to 2015. Data collected DHF patient characteristics include gender, age, occupation, mobility, knowledge about dengue, DHF prevention behavior, and water reservoirs in the homes of people. Data potential horizontal transmission of dengue in view of the history of the disease and mobility are obtained through interviews and observation using a questionnaire. Data incidence of dengue and dengue activity epidemiology investigation of data obtained through observation in the clinic and direct interviews with Puskesmas officers. If the respondents are still children or aged under 15 years and / or recorded as deaths dengue, interviews conducted on family members aged 15-60 years to determine their transovari area cases of arrests of *Ae aegypti* and subsequent mosquito eggs collected for colonized to become adult mosquitoes later identified the Dengue virus by RT-PCR.

RESULTS

Distribution incidence of Dengue Hemorrhagic Fever (DHF) in the Tana Toraja highlands at an altitude of 700-1425 meters above sea level at its lowest plateau is located in the District of Rano with an altitude of 700 meters above sea level and is the highest plateau in the District Bittuang with a height of 1425 meters above sea level. DBD incident occurred at an altitude <1000 (masl) .KecamatanMakale With a height of 760 meters above sea level is the region with the highest incidence of dengue every year. Besides at an altitude <1000 masl incidence of dengue also occurred at an altitude> 1000 m above sea level, namely the districts Bittuang also found cases annually. The results of the examination of the mosquito eggs by RT-PCR showed positive presence of dengue virus.

Table 1. Distribution of the number of patients with Dengue hemorrhagic fever in Tana Toraja based topographic year period 2012-2015

No	Regency	Elevation (above sea level)	Case			
			2012	2013	2014	2015
01	Bonggakaradeng	920	0	7	0	3
02	Simbuang	1378	0	0	0	1
03	Rano	700	0	3	0	1
04	Mappak	1088	0	0	0	0
05	Mengkendek	974	2	10	5	9
06	GandangBatuSillanan	980	3	6	10	2
07	Sangalla	817	0	10	8	10
08	Sangalla Selatan	781	0	5	5	3
09	Sangalla Utara	781	0	0	1	0
010	Makale	760	2	69	37	39
011	Makale Selatan	736	0	1	4	1
012	Makale Utara	820	4	11	14	6
013	Saluputti	853	1	7	7	5
014	Bittuang	1425	3	6	4	6
015	Rembon	762	1	8	7	12
016	Masanda	864	0	2	2	2
017	MalimbongBalepe	859	0	1	1	2
018	Rantetayo	884	1	5	3	5
019	Kurra	882	0	3	3	1

Distribution incidence of Dengue Hemorrhagic Fever (DHF) in every district in the highland districts of Tana Toraja shows the largest number of cases are in Sub Makale 147 cases during the past 4 years there is an altitude of 760 (masl), Genesis incidence of Dengue Hemorrhagic Fever (DHF) above 1000 masl contained in Bittuang districts, although the number of cases every year a little but there is a case.

Number of dengue cases over the last five years (2012 -2015) in the Tana Toraja highlands there are 390, 2015 there have been 106 cases. Most of the respondents are male (52.83%), aged ≥ 15 years (63.20%), did not work (68.85%), mobility (76.41%), have knowledge about good health (54.72%), poor health behavior (66.03%), and most of the respondents have a water reservoir (94.33%).

Table 2. Distribution Characteristics of Respondents

Variable	Category	n	%
Sex	man female	56 50	52,83 47,17
Age	≥15years <15years	67 39	63,20 36,80
Work	farmer entrepreneur Private employees Servant / Army / Police	1 4 2 27	0,94 3,77 1,88 25,47
Doesn't work	Housewife /College student Etc	17 9 47	16,03 8,49 44,33
Mobility	no yes	81 25	76,41 23,59
Health Sciences	Not good Good	48 58	45,28 54,72
Healthy behavior	Not Good Good	70 36	66,03 33,97
Water reservoir	There is There is no	100 6	94,33 5,67

Potential horizontal transmission of Dengue Hemorrhagic Fever (DHF) respondents believed the local case is most likely derived from local transmission source region because of frequent inter-regional mobility of non-endemic to endemic area.

DISCUSSION

Mosquitoes *Ae.aegypti* live at an altitude of 0-500 meters above sea level with a high vitality, while at an altitude of 1000-1500 meters above sea level is the limit the spread of the Aedesaegypti mosquito as the height of the mosquito cannot survive due to the temperature change is decreased so that mosquitoes cannot live optimally[3]. Tana Toraja is a region with an altitude of 700-1425 meters above sea level and are included in the category of a plateau that does not allow for the spread of dengue cases. However, within the last year period of 2012-2015 have been found dengue fever cases has fluctuated annually. Peak outbreaks occurred in 2013 and was first discovered cases of death. The same thing happened to the research conducted by Saul LF in Puebla City Mexico tahun2011, that *Ae. aegypti* as the main vector of dengue fever were found living in the highlands of 1700 meters and a positive carry dengue virus that causes the high incidence of dengue in the country.

Ae.aegypti is antrophilic live close to humans for the necessities of life, especially female. Female mosquitoes need human blood to sustain reproduction. Spreading Ae.aegypti affected by temperature and humidity, according to the height of a region has a rainfall intensity of different, yet able to make their breeding place for mosquitoes Ae.aegypti. Although *Ae. aegypti* has a limited flight range between 50-100 meters, but can be transported long distances in artificial containers through human activities, including to areas outside the range specified. The incidence of dengue fever in the highlands during the winter as in the Mexican border by 32% with many finding of larvae in containers such as waste tires and buckets[4]. Similarly, research conducted by Michael AJ (2008) in the State of Puerto Rico and research Victor EPM[5]in Brazil which examines the transmission models of dengue vectors that are influenced by local and global effects of factors. Connectivity highlands and lowlands as well as the improvement of transport allows the migration of people with viremia to the highland region and there is a history of interaction with the vector of dengue fever when traveling lowlands and highlands. Of the cases of DHF patients more in men, most likely it happens because cytokine production in women greater than men so that the immune response in women better than men. In addition, men are more

interested in traveling outside the area that possibility is endemic dengue. Another possibility is a resident of Tana Toraja highlands region who are looking for activities to the lowlands such as the city of Makassar Maros or which are endemic area. In men so that the potential of contracting dengue becomes larger. Regarding the relationship of age with DHF were also found by other researchers explained that most of DHF patients aged ≥ 15 years. This is likely due to transmission of the virus occurred in various places spent most of the time outside the home, such as at work or school. It indicates the location of dengue virus infection has changed, no longer around the home environment. The relationship between the incidence of DHF also work in accordance with the results of several other studies that explain that themajority of patients with DHF is a group that does not work like or housewives and children. This is most likely due to people who do not work a chance to interact with the environment that tends to be narrower than the people who work so as to have a relatively lower knowledge. Knowledge of good health that comes from personal experience and others. Work is alsowith earnings that can be used to maintain good health through the intake of healthy and nutritious food that is expected to increase endurance. The findings about the relevance of mobility variables and dengue are also reported Wichmann[6], explain that most patients with DHF mobility outside the region. Most likely it was due to the advancement of transportation increasing population mobility so easily spread of dengue-transmitting resources from one area to another either from endemic areas to non-endemic. The high mobility of the population due to job site, a search of health services, shopping outside the area, or visiting relatives, as well as to the tourist attractions. The relationship between health knowledge by the incidence of DHF in accordance with the findings of several other studies explain that the majority of patients with DHF have a good knowledge about dengue. This is most likely to occur because of the opportunity to get information about dengue from health professionals when patients are undergoing treatment at the center of health care centers. In addition, the education level of patients who otherwise able to receive a variety of information related to dengue from electronic and print media as well as health workers. The higher a person's education, the broader insights that increase knowledge, including dengue. Relationships healthy behaviors and incidence of dengue is also found in some other studies explain that the majority of patients with DHF misbehave in carrying out dengue prevention activities. This is most likely to occur because of a lack of awareness on health behaviors to prevent dengue. The discrepancy between knowledge and behavior showed health knowledge and health behavior showed good knowledge does not necessarily lead to behavior to prevent transmission of dengue good. The existence water reservoir can be a breeding ground for *Ae. aegypti*. People have deliberately kept a clean water for daily use as much of the source of water.Thewater reservoir can become breeding places of *Ae. aegypti*. Of the 106 cases that exist in 2015, is a local case which most likely suffered from contagion from a local source in the highlands. This is supported by the discovery of breeding sites and larvae (larvae) Ae. Aegypti containing dengue virus positive after PCR performed with around the residence of cases in the highlands. Vertically virus transmission is vertical transmission of dengue infective female mosquitoes to their offspring. This means that infectious dengue mosquito can transmit the virus to their eggs[7,8,9]. The findings about the potential for horizontal transmission or a local case of dengue fever in accordance with previous studies. Although the rate of population mobility recorded high enough, none of the people who registered to travel to endemic areas of dengue virus, but for the district of Tana Toraja is a tourist area, so during the holidays many visitors from Maros and Makassar which is endemic dengue[10.] There is only one health center that is capable of conducting an epidemiological investigation DHF according to the procedure remains the Ministry of Health of the Republic of Indonesia. DHF epidemiological investigation conducted in accordance with procedures still lacking the Ministry of Health. This suggests that the capacity of health centers in the investigation of the epidemiology of dengue in Tana Toraja highlands such should be increased[11,12]. To that end, the ability of the epidemiological investigation of cases of dengue fever in new territories plateau should be improved, especially tourist areas like Tana Toraja.

CONCLUSIONS

Horizontal transmission of dengue in the highlands of poor health behavior, and have water reservoirs. Found instances of alleged local case and not all health centers capable of conducting epidemiological investigation of dengue. Respondents mobility, citizens have the landfill at risk as a breeding place of mosquitoes Ae aegypti.

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Ethical Clearance: Ethical clearance obtained from university committee and respondent agreement.

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The Effectiveness of Nutritions Ergogenic Modified to the Local Endurance of Pamong Praja Police Personnel in Denpasar

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ABSTRACT

As the spearhead of securing local regulations issued by local governments /regents/ mayors, the existence of Pamong Praja Police in Indonesia is very vital. Besides having a good character, a Pamong Praja Police personnel must have a qualified physical fitness in relation to the tasks they perform. In carrying out its duties, Pamong Praja Police personnel often physical contact with people who do not agree with the wishes of the government. Therefore, the physical fitness of Pamong Praja Police personnel must always be well preserved. The best way to maintain optimal physical exercise is to exercise a routine and intake of nutritious foods.

Muscular Endurance is a durability that shows the ability of a muscle or a group of muscles in performing their tasks for a long time. Examples: weight training/weight training, drill jab practice many times in boxing, punch in wrestling

The purpose of this study is to determine the effectiveness of nutritions ergogenic modified to the local endurance of Pamong Praja Police personnel in Denpasar. The population is all of Pamong Praja Police personnel in Denpasar City who served in the field. The sample is determined by the Cochran formula. Sampling using Simple Random Sampling technique by drawing members of population (lottery technique). The type of research is Quasi Eksperimen and the design used is pre test-post test design. Testing data to determine the relationship between variables using Wilcoxon Signed Ranks Test and data processing using SPSS program.

The results showed that there was influence of modified Nutrient Ergogenic to endurance of arm muscle but no effect on stomach muscle endurance at sample of Pamong Praja Police personnel in Denpasar City.

The benefits of research that can provide input to the Local Government of Denpasar in terms of the role of regulation of food intake and sport activities in order to improve the local endurance of Pamong Praja Police personnel in Denpasar City, especially for personnel who served in the field.

Keywords: *Nutrition, Ergogenic nutrition, Modified ergogenic nutrition, Local endurance, Pamong Praja Police*

INTRODUCTION

The term ergogenic is derived from the Greek word ergo, which is defined to increase the potential of work or facilitate work. In sports known as ergogenic nutrition. Various ergogenic nutrients are often used by athletes in seeking to improve their performance. Some examples are modified carbohydrate loading diets, soda bicarbonate intake, caffeine, creatin, sports drinks, glutamine and amino acids. [1]

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Exercise of physical condition plays a very important role to maintain or improve the degree of physical fitness. To promote and maintain health, all healthy adults aged 18 to 65 year need moderate-intensity aerobic (endurance) physical activity for a minimum of 30 minutes on five days each week or vigorous-intensity aerobic physical activity for a minimum of 20 minutes on three days each week. The process of physical exercise is done carefully, repeatedly with the proper regulation of workload causes the physical fitness of a person is increasing. This will cause a person to become physically skilled, strong and efficient in his movement.[2]

Proper physical and physical exercise regulation will not work well in improving physical fitness if without proper dietary adjustment, especially the regulation of carbohydrate intake as a source of energy.[3] Based on the above description, researchers interested in conducting research to get answers how much effectiveness of ergogenik modified nutrition to the local endurance of Pamong Praja Police personnel in Denpasar City.

MATERIALS AND METHOD

The type of research used was Quasi experimental research with randomize pre test-post test design.[4] This research is located in Pamong Praja Police personnel Office of Denpasar City. The population in this research is Pamong Praja Police personnel of Denpasar City both men and women who served in the field, while the research sample is part of the population whose number is determined by Cochran formula.[5] Furthermore, sampling from the population using Simple Random Sampling technique lottery technique (lottery technique), so that the end result obtained the exact number of research samples. Furthermore, the selected sample is used as research object. Local endurance data with Test Push Up and continued with Test Sit Up. Number of Push Up and Sit Up that can be done each for 1 minute in comparison with the standard to obtain the category of local endurance.[6]

Weight data obtained by weighing the weight using the scales with a capacity of 250.0 kg and a precision of 0.1 kg. Body height data were obtained by measuring sample height using mikrotoice with a capacity of 200.0 cm and a precision of 0.1 cm, in upright position without footwear, facing the measuring officer.[7]

Treatment

Modified nutrient ergogenic giving is by giving dietary carbohydrate loading modified [8] as follows:

a) Seven days before the post test or the first day of treatment is given medium-intensity exercise to spend glycogen deposits

b) On days 2-4 a high-protein, high-fat, high-carbohydrate diet to meet energy needs, but prevent glycogen filling

c) On days 5-7 before the post test is given a high carbohydrate diet (70% of total energy) to maximize glycogen into the muscle that is depleted of glycogen. At this time the exercise is reduced to reduce the use of muscle glycogen and ensure maximum savings on post test day (day 8)

Implementation of Measurement and Exercise

Four days before the pre-treated treatment is the measurement of local endurance with sit up test and push up test. The result is then compared with the standard so that the local endurance data is obtained before the treatment.

On the 1st day of treatment, medium impact training was given with push ups and sit ups for 1 minute each, samples also jogging and running each for 20 minutes. On the 2nd day until the 4th day of treatment, they were given push up and sit up exercises for 1 minute each, then samples doing 2 types of exercise every day (jogging, healthy walking, running and gymnastics). On the 5th and 6th days, each of them is given a physical fitness exercise for 5 minutes and a healthy walking for 5 minutes. On Day 7 no training is given. Implementation of exercise in the morning before working hours. On the 8th day post test.[6]

Processing and analysis of data

Data processing

The collected data is processed by computer, then the result is presented in table form and narrated. To determine the local endurance that is the number of sit ups and push ups that can be done in 1 minute compared with the standard[6] so obtained the category of local endurance sample.

Data analysis

To determine the effect of ergogenic modified nutrient to the local endurance of Pamong Praja Police personnel in Denpasar City, Wilcoxon Signed Ranks Test [9] was used using SPSS program.

RESULTS AND DISCUSSION

Body Mass Index (BMI)[10] is a simple way to monitor the nutritional status of adults, especially those related to deprivation and overweight. With this BMI can be determined weight and risk.

Table 1: Distribution of Weight-Loss Category Based on BMI Value

Weight Category	n	Percentage
Normal (BMI=18,50-24,99)	11	20,0%
Pre Obesity (BMI=25,00-29,99)	29	52,7%
Obesity Class 1 (BMI=30,00-34,99)	15	27,3%
Total	**55**	**100,0%**

From Table 1 above, based on the calculation of Basal Metabolism Index (BMI) value of body weight (in kilograms) versus the height quadrate (in Meter units) it can be seen that most of the sample, ie 29 (52,7%) heavy category his body includes pre-obesity.

Sports Habits

From the results of interviews were all regular samples of exercise, this is because the leadership requires that every member to always exercise for physical fitness is maintained. In the office, samples every Friday morning there is gymnastics activities, or a healthy walking and every time there are activities Kesamaptaan. While the sports are occupied outside the office are diverse, there are volleyball (13.3%), jogging (46.7%), gymnastics (26,7) and yoga, futsal, soccer and push up each 6.7%.

Regarding the time and frequency of exercise, most of the samples stated that the length of time in a single exercise is for 60 minutes as much as 46.7% and most also stated that the frequency of exercise in a week as much as 2 times that is as much as 73.3%.

Correlation Analysis

1). Basal Value Metabolism Index (BMI)

The table below presents the BMI Value with Formula: Weight (Kilogram Unit) divided by Height squared (Meters Unit). This data is BMI data before and after treatment.

Table 2: Distribution of Basal Metabolism Index Categories Before and After Treatment

BMI Categories	Before		After	
	n	%	n	%
Normal (18,50-24,99)	11	20,0%	26	47,3%
Pre Obesity (25,00-29,99)	29	52,7%	26	47,3%
Obesity Class 1 (30,00-34,99)	15	27,3%	3	5,4%
Total	**55**	**100,0%**	**55**	**100,0%**

Based on statistical analysis using Wilcoxon Signed Ranks Test with $\alpha = 0,05$, the mean value (μ) BMI before treatment was 25,6453 and after treatment was 25,2807, with Sig value (2-tailed) = 0,001 smaller of α (0.05), so this value is strong evidence to reject Ho: μ Before = μ After treatment. So the conclusion of the mean before and after treatment is not the same, meaning there is influence of treatment to body weight of sample.

The decrease of BMI after treatment with the application of ergogenic nutrition was modified combined with the sport activity arrangement in the sample of Pamong Praja Police personnel of Denpasar City is not apart from the obedience of each sample to follow the rules given during the first 4 days of consecutive treatment ie reducing the carbohydrate intake and increasing the sport activity

This decline in BMI values is a reflection of weight loss, and weight loss can occur in the event of breakdown of stored glycogen in the body. The breakdown of glycogen especially glycogen in muscle occurs when carbohydrate intake is reduced with increased exercise activity.[11]

The decline in BMI values also indicates that carbohydrate loading for Carbohydrates Loading on days 5 to 7 days (for 3 days) does not necessarily

increase sample weight. The process of increasing muscle glycogen deposits with a high carbohydrate diet usually lasts six days.[12]

2). Local Muscle Endurance

a. Abdominal Muscle Endurance

Abdominal muscle endurance is measured by performing Sit Up movements repeatedly for 60 seconds. Abdominal muscle endurance measurements can be presented in Table 3 below.

Table 3: Distribution of Abdominal Muscle Endurance - Before and After Treatment

Category	Before		After	
	n	%	n	%
Specialties	4	7,3%	4	7,3%
Good	4	7,3%	8	14,6%
Quite	4	7,3%	7	12,7%
Medium	10	18,1%	18	32,7%
Low	33	60,0%	18	32,7%
Total	**55**	**100,0%**	**55**	**100.0%**

Based on Table 3 above there is an increase in abdominal muscle endurance in each category, except in Special Category there is no increase or decrease. Along with the increase in the other categories, the opposite occurs in the Low category, which is 27.3% decrease.

Using the Wilcoxon Signed Ranks Test analysis with $\alpha = 0.05$, the mean value (μ) of abdominal endurance before treatment was 4.2000 and after treatment of 3.7333, with Sig value (2-tailed) = 0.323 more magnitude of α (0.05), so this value is strong evidence to accept Ho: μ Before = μ After treatment. So the conclusion is mean value before and after the treatment is the same, meaning there is no effect of treatment on abdominal muscle endurance.

The muscles in the abdomen are muscles that are generally not often driven and rarely used for heavy loads. In an untrained person, moving the abdominal muscles by doing repeated sit ups (repetitions) with a certain amount of time within a few days can cause abdominal pain especially 2-3 days after sit up exercise, this is also stated by 53, 3% of the sample. The sample felt a painful stomach so uncomfortable doing sit up test. Perceived pain caused the frequency of sit up pre and post test tends to remain (stagnant) that there are as many as 26 samples (47.3%), and some even decreased by 4 samples (7.3%).

b. Arm Muscle Endurance

The endurance of the arm muscle is measured by performing Push Up motion repeatedly for 60 seconds. The results of the arm muscle endurance measurements can be presented in Table 4 below.

Table 4. Distribution of Arm Muscle Endurance-Before and After Treatment

Category	Before		After	
	n	%	n	%
Super	18	32,7%	33	60,0%
Specials	0	0,0%	15	27,3%
Good	18	32,7%	0	0,0%
Medium	7	12,7%	4	7,3%
Poor	12	21,9%	3	5,4%
Total	**55**	**100,0%**	**55**	**100.0%**

Based on Table 4 above there is an increase in the number of samples with Super Categories, and Special Category respectively of 27.3%, and there is a decrease in the number of samples with Bad Category, Medium and Good each of 16.5%, 5.4 % and 32.7%.

By using Wilcoxon Signed Ranks Test analysis with $\alpha = 0.05$, the mean value (μ) of arm muscle endurance before treatment was 2.8667 and after treatment of 1.7333, with Sig value (2-tailed) = 0.007 more magnitude of α (0.05), so this value is strong evidence to reject Ho: μ Before = μ After treatment. So the conclusion of the mean value before and after the treatment is not the same, meaning there is effect of treatment on arm muscle endurance.

Carbohydrate loading is a strategy to increase the amount of calories stored in the muscle by regulating the food intake, especially the source of calories with the aim of improving performance. Some athletes use this Carbo-Loading technique to get around their muscles to be able to store extra glycogen before the competition. Carbo-Loading can make muscles store glycogen nearly twice the normal amount that can be accommodated.[13]

Seeing the results of this study shows the successful

implementation of Carbohydrate Loading regardless of other factors that play a role. Of the 55 samples whose BMI decreased, 44 samples of which muscle endurance increased. This shows the process of emptying glycogen deposits through the application of the modified nutritional ergogenic intake method successfully.

The results of this study in accordance with the theory proposed by Jeukendrup which states that carbohydrates increase the capacity of resistance, especially simple carbohydrates, thereby reducing fatigue due to long exercise.[14-17]

Similarly, Roscamp who reported the results of his study that a diet high in carbohydrates can improve performance by 2 to 3%, increased muscle glycogen content early will delay fatigue approximately 20% in exercises lasting more than 90 minutes.[18]

CONCLUSION

The mean value endurance of abdominal muscles before and after treatment is the same, meaning there is no effect of treatment on stomach muscle endurance in a sample of Pamong Praja Police personnel in Denpasar City who served in the field.

The mean value endurance of arm muscle before and after treatment is not same, meaning there is influence of treatment to endurance of arm muscle in sample of Pamong Praja Police personnel in Denpasar City who served in field.

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Etichal Clearence: Ethical Clearance obtained from the university committee and respondent assignment.

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Spatial Distribution of Dengue Haemorrhagic Fever (DHF) Vulnerability Level based on Population Density, Rainfall, Drainage Condition, Natural Water Body, and Vector Control Program in Tanjung Redeb Sub-District, District of Berau, East Kalimantan

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ABSTRACT

Dengue hemorrhagic fever (DHF) has still become a major health concern in the world particularly in the tropical and sub-tropical area such as South-east Asia including Indonesia. In 2010, about 1.317 mortality due to dengue out of 150.000 cases has made Indonesia become the highest case of DHF country in South-east Asia. The province of East Kalimantan represents the endemic region of DHF and contributes the highest cases in Indonesia especially in the sub-district of Tanjung Redeb, district of Berau. This study investigated the level of vulnerability of DHF at sub-district scale based on population density, rainfall, drainage condition, natural water body and vector control program. A geographical information system (GIS) software were used for mapping the spatial distribution of vulnerability area of DHF in sub-district of Tanjung Redeb for every three months period of 2014. The level of DHF vulnerability in Tanjung Redeb was fluctuate. At the first three months was medium, and continues to become high level at the second and third three months, then become medium level at the last three months during 2014-time period. This result indicates that the spatial distribution based on climate, landscape, and human factors might be used to predict the vulnerability area of DHF at the fine scale such as sub-district level. This information will in turn may help government to conduct a better strategy for controlling the transmission of DHF in each area.

***Keywords*:** *Level of Vulnerability, DHF, GIS, Tanjung Redeb-Berau*

INTRODUCTION

Dengue has still become a major health concern in the world particularly in the tropical and sub-tropical areas such as South-East Asia including Indonesia. Dengue Hemorrhagic Fever has impactson theenvironmentand economic in this region[1]. It is estimated over 50 million people were infected annually with dengue and up to 500.000 people develop a potentially lethal complication called dengue hemorrhagic fever/dengue short system[2]. Mosquito vector, Aedesaegypti are endemic to most of thetropical and sub-tropical region over the world. Prevention and control program are the main methods of reducing the prevalence of the diseases (DHF). Hence, goodstrategy for the prevention and control system is needed. Several studies have been conducted in various regions over the world to studythe link of environmental factors and the prevalence of dengue fever by using spatial analysis.There were approximately fifty million dengue haemorrhagic fever (DHF) infection and about 2,5 million people live in the dengue endemic regions[3]. Dengue fever (DF) associated dengue haemorrhagic fever / dengue shock syndrome has emerged as an important public health problem in the countries of the South East-Asia and Western Pacific region.

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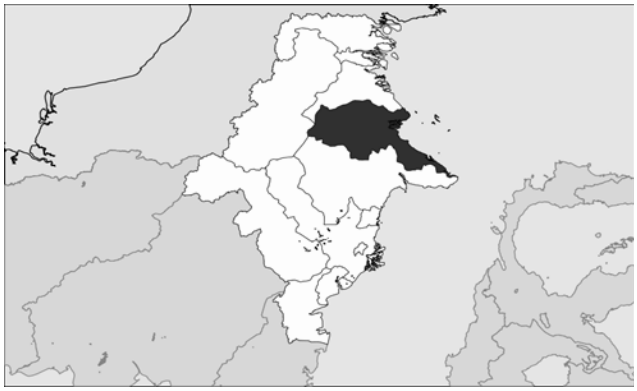

Figure. 1 Study area with principal cities and town

Geographical Information System (GIS) and SPSS are utilized to deliver more information to prevent DHF disease. The objective of this study was to investigate the DHF vulnerability level based on the population density, rainfall, drainage condition, natural water body, vector control using GIS.

Dengue fever (DF) and dengue hemorrhagic fever (DHF) are caused by the dengue virus. Virus of dengue is a mosquito-borne infection which in recent years has become a mayor international public health concern. Several studies have been applied in term of Applying geographical information system (GIS) corresponding to the dengue hemorrhagic fever such as mosquito habitat and dengue risk potential in Hawaii; a conceptual framework and GIS application[4]. There are few studies have analyzed spatial distribution vulnerability level based on population density, rainfall, drainage condition, natural water body, and vector control. In this context, application of GIS modeling for dengue fever to the prone area based on socio-cultural and environmental factors[5]. Application of GIS in modeling of dengue risk based on sociocultural data, found that any steps taken to improve any of the social and cultural practices would have favorable effects on reducing dengue case[6]. The use of GIS in Ovitrap monitoring for dengue control Singapore, found that GIS was used to plan vector surveillance and control operations[7]. Modeling dengue fever risk based on socioeconomic parameters, nationality and age group; GIS and remote sensing based case study,found that there was a strong positive association between dengue fever cases and socio-economic factors[8]. Numerous reviews have broadly addressed the used of geographical information systems (GIS), mapping and spatial and space-time modeling approaches in operational control program[9-11]. The weather variability such as monthly maximum, minimum temperature, rainfall, and relative humidity identified as meaningful and significant indicators for the increasing occurrence of dengue fever[12]. Incorporating GIS mapping and google earth technologies in a dengue surveillance system for developing countries might be used to prioritize control strategies and to target interventions to highest risk areas in order to eliminate the likely origin of the mosquito vector[13]. Geographical information systems is also utilized to assessing the spreading patterns of dengue infection and chikungunya fever outbreaks[14].

This study aims to investigate the level of vulnerability of DHF at sub-district scale based on population density, rainfall, drainage condition, natural water body and vector control program. A geographical information system (GIS) software were used for mapping the spatial distribution of vulnerability area of DHF in sub-district of Tanjung Redeb for every three months period of 2014. To know the level of vulnerability of dengue hemorrhagic fever, this study analyzes the data using an SPSS approach and then the result would be converted to the Geographical Information System (GIS). With those facts in mind, there are few studies have been published using GIS methods to model the spatial relationship between dengue fever cases, population, population density, to create a predictable mapping of level of vulnerability based on environmental, climate, and human factors. This study hypothesizes that the spatial distribution based on climate, landscape, and human factors might be used to predict the vulnerability level of dengue haemorrhagic fever (DHF) at fine scale and could help thegovernment to conduct a better strategy for controlling the transmission of DHF in each area.

MATERIALS AND METHOD

Study Area

This research was conducted in Tanjung Redeb, District of Berau since of the major dengue epidemic that occurred in East Kalimantan, Indonesia. Tanjung Redeb is the capital city of Berau on the island of East Kalimantan. Around 83.942 inhabitants, consist of 45.127 men and 38.856 women distributed over an area of 23,76 km2, with a population density of around 2.848,36 inhabitants/ km2 and a number of 235,178 household. In every year, wide range spread of dengue hemorrhagic fever (DHF) occurs in East-Kalimantan and caused high mortality. Actually, prevention of DHF

has been conducted but the diseases still exist in the area. DHF is significantly increasing during 2010-2011 in Tanjung Redeb where there were 144 cases in 2012. Distribution of thepopulation of sub-district of Tanjung Redeb shown in Table 1.

Table 1. Distribution of population based on sub-distribution in Berau Districts

No	Sub-District	Men	Women	Total
	Sungai Bedungun	4.553	3.867	8.380
1	Tanjung Redeb	12.741	10.865	23.606
2	Bugis	8.053	6.886	14.919
3	GunungPanjang	5.311	4.550	9.861
4	KarangAmbun	7.203	6.242	13.445
5	Gayam	7.266	6.466	13.732
Total		**45.127**	**38.856**	**83.942**

Data Collection and Analysis

Data have been collected consist of primary and secondary data. Primary data were collected through a filed survey. The questionnaire covered about gender, occupational pattern, awareness, and knowledge about dengue, mosquito protection practice. Secondary data were obtained from three government office including health office, city office and statistic office. The collecting data was conducted on March 2015 to September 2015. The data were collected in Tanjung Redeb such as population density, rainfall, drainage condition, natural water body and vector control used in the building of GIS layer to create the dengue potential map. Geographical Information System (GIS) is an automated computer-based system with the ability to capture, retrieve, manage, display and analyze large quantities of spatial and temporal data in a geographical context. In this study, GIS is utilized to demonstrate the spatial distribution of dengue hemorrhagic fever (DHF) vulnerability level based on population density, rainfall, drainage condition, natural water body and vector control program.This research used analysis epidemiology with ArcGIS 10.

RESULTS AND DISCUSSION

The questionnaireswere administered during the survey to the randomly selected respondents for data collection. SPSS software was employed for the parameter estimation and GIS then used to create the dengue potential map. We divided three-part sub-sections to describe the main result.

Spread of DHF

DHF data in District of Berau is provided by Abdul Rival Hospital, it is an official hospital of Berau. The data were reported in weekly and monthly. The DHF was significantly increasein TanjungRedeb during 2013 and it might become aserious problem if not addressed properly. The following is amapping of DHF based on the data during 2013 in Tanjung Redeb. As can be seen in Fig. 2 that the red color is anareaof DHF case, the number of DHF case in thedistrict of Berau is 169 cases in 2013, and there were 111 cases in Tanjungredeb. It means 65.68 % of DHF in District of Berau exist in Tanjung Redeb.

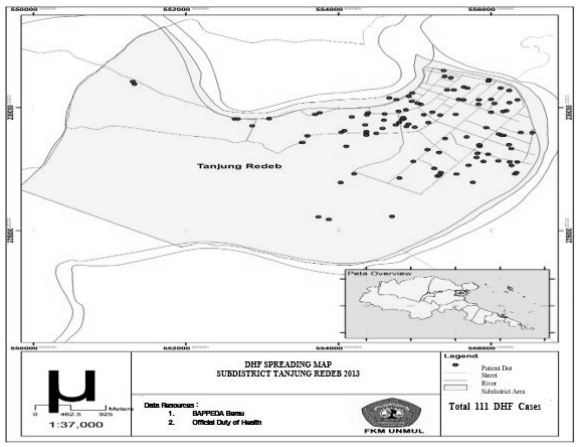

Fig. 2 Spread of DHF in Tanjung Redeb at 2013

The Level of Vulnerability

The level of Vulnerability was obtained by analyzing the determinant variable such as population density, landscape, rainfall and larva free index. The variables which have been given value (signed) and weighting according to the magnitude of the effect of vulnerability of time and area toward DHF and then over layer. Its result then divided within three class categories/level namely low risk, medium risk, and high risk of DHF. This prediction would be areference point for future research since the population density, landscape, rainfall, and larva free index would not be significantly changing in shortly time, therefore this research is assumed relevant for preventing based on time and area, and risk each other. The following is amapping of thevulnerability of DHF during 2014 and divided into four quarters. Fig. 3 is amapping of vulnerability level of DHF for thefirst quarter.

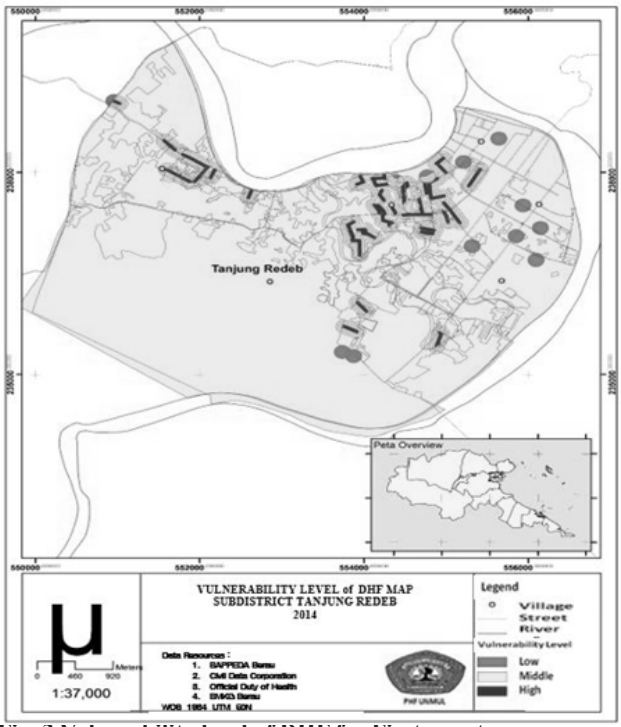

Fig. 3 Vulnerability level of DHF for First quarter

Fig. 3 shows that there are some areas with vulnerability level medium and some areas exist in high vulnerability level as well as a few areas exist in low level. The vulnerability level of DHF for 2nd quarter is presented in Figure 4.

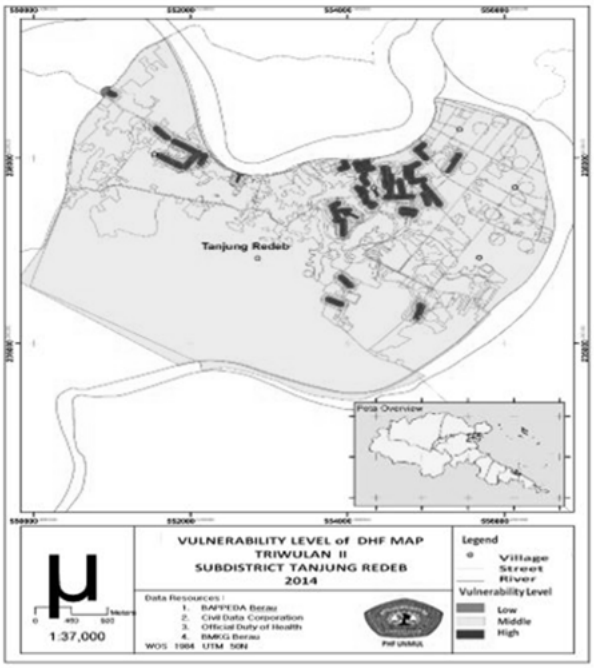

Fig. 4 Vulnerability level of DHF for 2nd quarter

As can be seen in figure 4, there are several areas exist in high vulnerability level and there were some areas exist in medium vulnerability level. The vulnerability level of DHF for 3rd quarter is shown in figure 5.

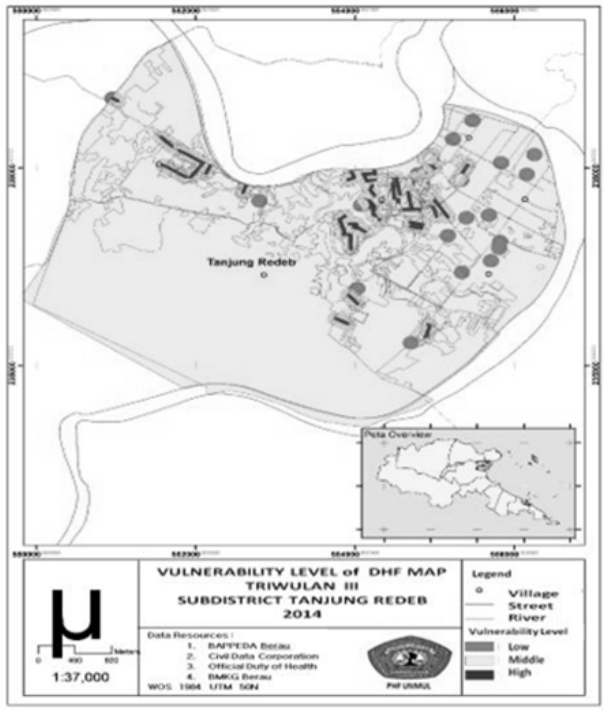

Fig. 5 Vulnerability level of DHF for third quarter

Figure 5 shows that the vulnerability level of DHF almost same between high, moderate, and low level. The vulnerability level of DHF for 4th quarter is depicted in figure 6.

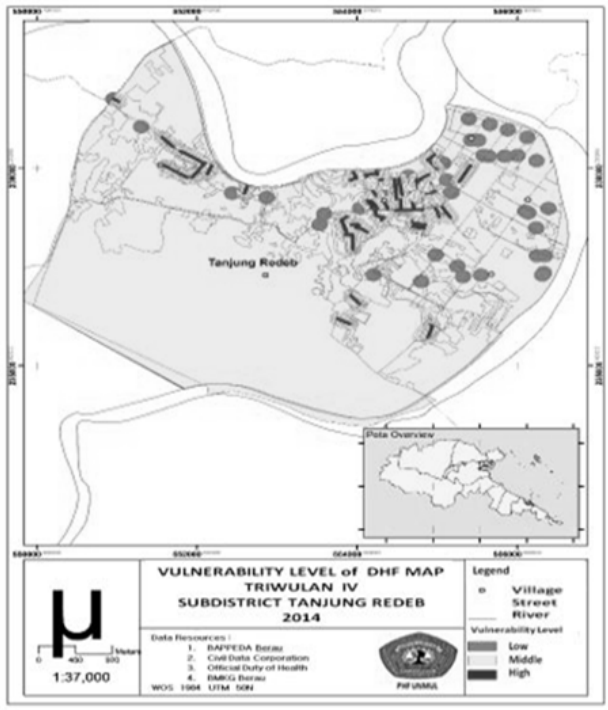

Fig. 6 Vulnerability level of DHF for fourth quarter

In figure 6, it shows that the low vulnerability level of DHF is higher than moderate and high level.

The main objective of the study is to investigate the spatial distribution dengue haemorrhagic fever (DHF) vulnerability level based on population density, rainfall, drainage condition, natural water body, vector control program. Analysis of the survey data revealed that the level of DHF vulnerability in Tanjung Redeb was fluctuate as described in a map by GIS. Applying of geographical information system analysis has improved corresponding between socioeconomic factors and dengue haemorrhagic fever (DHF) prevalence. In line with previous study (AlphanaBohra et. Al, Korine N. Kolires, Krishna Prasad et.al), the application of GIS in modeling of dengue risk based on sociocultural data; case of Jalore, Rajasthan, India has found that the sociocultural factors such as the housing patterns, limited use of mosquito protection measures, irregular water supplies, poor management of waste disposal, storage of water on the premises due to inadequate water supplies in summer months, and prolonged storage of water for domestic and other purposes significantly affected the incidence of dengue[4]. This result to be relevant with the recent study. Mosquito habitat and dengue risk potential in Hawaii: A conceptual framework and GIS application argued that by modifying inputs through a variable weighting process, decision regarding mosquito and disease control can be adjusted based on specific temporal and local spatial variation[2]. Application of GIS modeling for thedengue fever prone area based on socio-cultural and environmental factors–A case study of Delhi City Zone. It was found that GIS modeling was done to generate risk map of dengue incidence[3]. This result revealed that there is relevant between previous and recent study. Advances in mapping, geographical information systems technologies, and progress in spatial as well as space-time modeling could be harnessed to prevent and control the diseases[9]. Hence, this study showed that the spatial distribution of vulnerability level of Dengue Haemorrhagic Fever DHF based on population density, rainfall, drainage condition, natural water body, and vector control program could be predicted. Even though the examined models were supported and the results were generally in line with previous studies, there are limitations associated with the present study[15-17].

CONCLUSION

Geographical Information system modeling was done to create map potential of vulnerability level of dengue haemorrhagic fever, with three levels such as high, medium, and low-level risk. This study also revealed that dengue haemorrhagic fever generally occurred in areas with high density population. The data analysis and modeling show that the population density, rainfall (climate change), drainage condition (landscape), natural water body, and vector control have higher influence on dengue haemorrhagic fever incidences. A geographical information system software was used for mapping the spatial distribution of vulnerability area of DHF in sub-district of Tanjung Redeb for every three months period of 2014. Level of DHF vulnerability in Tanjung Redeb was fluctuate. At the first three months was medium, and continues to become high level at the second and third three months, then become medium level at the last three months during 2014-time period. This result indicates that the spatial distribution based on climate, landscape, and human factors might be used to predict the vulnerability area of DHF at the fine scale such as sub-district level. Therefore, this result will in turn may help thegovernment to conduct a better strategy for controlling the transmission of DHF in each area. Given the importance of the information of vulnerability level of dengue haemorrhagic fever, development of geographical information system in prevention of public health area still need to be explored further.

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Yoga Pregnancy Guidance Increase Knowledge, Attitude and Skill of Pregnant Woman in Implementing Yoga in the Village Dawan Kaler, Klungkung, Bali

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ABSTRACT

Background: Pregnant women who are less physically active tend to have an prolonged labor that increases the risk of maternal and fetal death

Objective: To determine the influence of yoga pregnancy guidance to knowledge, attitudes and skills of pregnant women in implementing yoga.

Method: Pre-experimental research design of one group pretest-posttest design and use Purposive sampling technique, has been conducted on 30 respondents. Knowledge and attitude variables were measured using a questionnaire, skills observed by observation sheets. Statistical test using Wilcoxon test.

Results: This study noted that knowledge increased in the first post test counted 24 people (p value ≤ 0.001) and knowledge increased in the second post test as many as 28 people (p value ≤ 0.001). The attitudes of pregnant women increased in the first post test by 14 people (p value ≤ 0.001) and the attitude increased in the second post test by 24 people (p value ≤ 0.001). Maternal skills improved in the first post test of 16 people (p value ≤ 0.001) and skills increased in the second post test by 30 people (p value ≤ 0.001).

Conclusions: There are significant influence of yoga pregnancy guidance on knowledge, attitudes and skills of pregnant women in implementing yoga

Keywords*: Guidance, yoga, pregnant women, knowledge, attitude, skills.*

INTRODUCTION

Indonesia is one of the countries that failed to reduce maternal mortality rate (MMR) in the ASEAN region. Based on results of Health Demographics Survey of Indonesia in 2012 that MMR recorded significant increase that is amounting to 359 per 100,000 births life. The target of *Sustainable Development Goals* (*SDGs*) for MMR in Indonesia on 2015 -2030 that is equal to 70 per 100,000 live birth, Infant Mortality Rate (IMR) decreases to 12 per 1,000 live birth. The National Target Term Development Plan Medium of Indonesian Ministry of Health on 2015-2019 were number MMR as many as 306 per 100,000 live birth and number of IMR as much 24 per 1000 births life[1,2.]

In addition to five kind of factors, there are psychic mother factor very take more effect. Maternal preparedness during childbirth is influenced by family and husband support or accompany mother will help comfort around delivering[3]. This hormone can cause tension of smooth muscle and vasoconstriction of blood vessels resulting in decreased uterine contractions, decreased uteroplacental circulation, reduced blood flow and oxygen to the uterus, and the onset of uterine ischemia which makes the pain impulse multiply[4].

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In primiparous, duration of labor in the first stage has a longer duration than the multipara, wherein the first stage of a long labor on primiparous about 13-14 hours while in multiparas about 7 hours[5]. The duration of labor in the first stage of primipara causes the pain to be experienced also longer so that the risk of fatigue will be greater resulting in an emotional response of anxiety, tension, fear and even panic. This shows that prolonged labor and infant mortality of the primiparas have a greater risk than in multiparas. In a study conducted by Cheng, et al in Budiarti mentioned that the prolonged labor had a risk of postpartum hemorrhage, chorioamnionitis, and increased intensive care in neonatal[6].

The natural and smooth labor can be achieved if the uterus contracts well, rhythmically and strongly with the lower segment of the uterus, cervix, and pelvic floor muscles in a relaxed state, so the baby easily passes through the birth canal. This can be achieved with the help of the pregnant woman itself which is the perfect calm and relaxation of the body[7-10]. Some of these are physical exercises that can be performed before, during, and after pregnancy. A pregnant woman with a normal pregnancy or without contraindications should be supported to carry out physical exercise with moderate intensity to benefit during pregnancy and labor[11,12].

The difference between pregnancy exercise and yoga is on "breathing". Yoga practice always refers to the breath. In yoga practice, pregnant women are clearly guided when to breathe, and when to breathe out[13,14].

Based on the above, researchers interested in conducting research on the effect of pregnancy yoga guidance on knowledge, attitudes and skills in performing yoga pregnant women in the village Dawan Kaler, Klungkung. Dawan Kaler is one of the villages which call by "Kampung KB" that has been set by the government, so that high community participation to a new program . The purpose of this study is to determine the influence of yoga guidance on pregnancy knowledge, attitudes and skills of pregnant women in implementing yoga. This article useful for improve the knowledge, attitudes , and skills of pregnant women in implementing yoga pregnancy as well as adding references regarding yoga pregnancy .

MATERIALS AND METHOD

The research was quasi-experiment carried out in this study with *one group pretest-posttest design* who has it under the questionnaire and observation sheet as a data collection instrument. As r esponden collected 30 pregnant women in Desa Dawan Kaler who met the inclusion criteria in the period from February to June 2017. Sampling technique used *Purposive Sampling*. Hypotesis was tested using Wilcoxon test. Ethics of research are *informed consent,* respect for privacy and confidentiality of respondents, in honor of the state, taking into account the benefits and disadvantages caused. The intervention conducted is to provide guidance of pregnancy yoga for pregnant women selected as respondents with lecture and discussion methods using *power point*, video and demonstration tools using *wireless*, mattresses and pillows.

RESULTS

The characteristic of respondents as follows:

Table 1: Characteristics of Research Subjects

Characteristics	Σ	%
1. Age		
20-25 years old	2 2	73.4
26-30 years old	8	26.6
2. Education		
Basic	6	20.0
Medium	22	73.3
High	2	6.7
3. Work		
IRT	19	63.3
Private employees	8	26.7
Civil servants	1	3.3
entrepreneur	2	6.7
4. Frequency of pregnancy		
1	20	66.7
2	10	33.3

Table 1 shows that the characteristics based on age of majority are 20-25 years old (73,4%), based on educational level, it is known that respondents have medium education as much as 73,3%, based on work known majority are housewife (63,3%), and based on the frequency of pregnancy know respondents majority are primiparas (66.7%).

Table 2: The Influence of Yoga Pregnancy Guidance on Knowledge, Attitudes and Skills of Pregnant Women

Indicators		Results			Z_W (Post Test 1)	Z_W (Post Test 2)	P value
		Pre-test (n=30)	Post Test 1 (n=30)	Post Test 2 (n=30)			
Knowledge	Less Enough Good	16 12 2	4 11 15	0 0 30	-4,481	-4,774	≤ 0,001
Evaluation of knowledge	Downhill Rising Permanent		1 24 5	0 28 2			
Attitude	Negative Positive	24 6	10 20	0 30	-3,742	-4,899	≤ 0,001
Attitude Evaluation	Downhill Rising Permanent		0 14 16	0 24 6			
Skills	Unskilled Skilled	30 0	14 16	0 30	-4,00	-5,477	≤ 0,001
Skills Evaluation	Downhill Rising Permanent		0 16 14	0 30 0			

Description : $Z_{W=}$ Uji Wilcoxon

Table 2 shows change of knowledge, attitude and skill of respondent from *pretest, first post test* and second *post test*. Score evaluation on the second *post test* show 28 respondents experienced an increase in knowledge (*p value≤ 0.001), 24* respondents experienced an attitude increase (*p value ≤ 0.001)* , 30 respondents experienced skill improvement (*p value ≤ 0.001)*.

DISCUSSION

Good guidance for society must involve all the five senses. In the guidance of yoga pregnancy is done by lecture and discussion methods, watching videos and demonstrations of the implementation of pregnancy yoga as well as the community is given the opportunity in carrying out yoga pregnancy. According Notoatmodjo (20 10) m ata is the most senses that channel knowledge into the brain. Approximately 75% to 87% of human knowledge is acquired / distributed through the eye, while 13% to 25% are channeled through other senses[15].

At the *pre test of* knowledge of pregnant women about pregnancy yoga in less category is 16 people. This happens because yoga pregnancy is still not popular in the community although the introduction of yoga has been increasingly done in the media information and social media. Interviews before counseling found that the respondent had only heard a glimpse of yoga and did not yet know that the yoga can be performed by pregnant women. This resulted in them not seeking the exact information about yoga pregnancy. Limited of remembering and understanding the information that is causing pregnant women tend not able to remember the information obtained. Other possibilities such as low curiosity because there is no need, low absorption, attention of pregnant women who are less interested in the information makes the respondents easily forget the information provided[16].

The results of first *post test* and second *post test* indicate an increase in pregnant women›s knowledge of pregnancy yoga is in the rising

category increased by 28 respondents and 2 respondents are permanent category (*p value* ≤ 0.001) . This suggests that pregnancy yoga guidance to pregnant women who are treated with an interactive method supported by audio visual media, as well as giving yoga book of pregnancy can arouse the interest of pregnant women to read, listen and practice yoga pregnancy . Thus the information submitted can be received well and clearly by pregnant women . Health education through guidance is an effort or activity to create a conducive community behavior for health. That is, the public realizes or knows how to maintain to the health and avoid or prevent things that harm the health[17]. The Perumal Study, N et al (2013) in Kenya found that pregnant women who were more often antenatal care and got higher knowledge information than those who did not visit[18].

Notoatmodjo writes that the increased knowledge and ability of one's thinking is influenced by information sources or readings. Information can be obtained from various sources ie health workers, friends and family, and mass media. Individuals who have understood the information provided, tend to give better perceptions than those who have not been informed. Generally presentations, counseling, lefleat, booklets that present information. The more frequently exposed to information can affect a person's level of knowledge (17). Anbu, V conducted a study in India found that yoga guidance to pregnant women improve the perception of pregnant women[19].

Health workers should give information or messages about health by use the mass media as tools that can further facilitate the understanding of society[19]. Babbar Study (2017) found that the role of health care workers is very important in motivating pregnant women. S ach time, every time, health workers should provide education to pregnant women in this case physical activity during pregnancy can alter persesi and knowledge of pregnant women[20].

According to Newcomb in Notoatmodjo (2005), attitude is a readiness or availability to act and is not a particular motive implementer. Attitude is not yet an action or activity, but it is a predisposition to behavioral behavior[17]. Based on pre test results found that 26 respondents still negative toward yoga pregnancy. Yoga became something foreign and is not trusted in Balinese culture. In accordance with the results of the study Guelfi[21] found that the beliefs, attitudes and attention in doing physical activity, especially pregnant women are influenced by local culture. The point is the subject to know the stimulus that comes either in the form of material or object. Knowledge and information greatly influence the formation of attitudes[17].

The results of first *post test and second post test* indicate an increase in attitude of pregnant women about pregnancy yoga is in the category increased by as many as 24 people (*p value* ≤ 0.001). Pregnant women feel very need to do yoga pregnancy after being given explanations and books on yoga. When the interview was revealed that previously pregnant women consider yoga should only be done by parents who already have knowledge. Respondents consider that pregnancy yoga is an exercise that could harm the health of themselves and their babies.

This study is in accordance with Babbar study results found that pregnant women have a positive attitude toward yoga after being given information and practice yoga pregnancy directly[20]. Pregnant women come to believe that with yoga pregnancy will be able to improve the health of himself and his fetus. Anbu Study found that with yoga pregnancy will be able to improve the perception and physical health of mother and fetus[19]. Study Reis found that pregnancy yoga enhances a sense of optimism, confidence in self power and improving maternal and fetal health[22].

Cramer H et al found that a pregnant woman willing to practice yoga depends on the advice of the health worker, the need for delivery preparation and location of yoga. Health workers are expected to provide health education at any time to motivate pregnant women to perform physical activities, one of which carries a yoga pregnancy[23-25]. May E, et al found that if health workers provide information and support pregnant women to do physical exercise then pregnant women will do it at home as much as 7.5 times[26]. The study also found health workers should motivate pregnant women to do yoga pregnancy because yoga has been proven to be very good for the health of mothers and infants.

CONCLUSION

The results of this study concluded that there is a significant difference in knowledge, attitude and skill pregnant women to implementing yoga before and after given yoga pregnancy guidance (*p value* ≤ 0.001) .

Conflict of Interest: All authors declare that there is no any conflict of interest within this research and publication including the financial agency

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Analysis of Active Content in "Salacca Vinegar" in Sibetan Village with Potential as Antidiabetic and Anticancer

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ABSTRACT

Price of salacca at harvest time in Sibetan village, Karangasem is very low, consequently researcher and farmers process it into vinegar . On the other hand natural compound is necessary to be used as anti-diabetic and anticancer. This study is aimed at analyzing active content of salacca vinegar, to know its potential in healthcare such as for anti-diabetic and anti-cancer. This is a descriptive research by analyzing the active content in laboratory.

The result of this research shows that salacca vinegar of Sibetan village contain high levels of acid as vinegar with total of 6.68%; total of phenols is 27.47 mg / 100ml GAE, total of tannins is 71.69 mg / 100ml TAE, flavonoid content is 26.51 mg / 100mi QE, antioxidant capacity is 70.21 mg / L GAEAC, IC 50 is 103.09 mg / ml, vitamin C is 4.6547 mg / 100g. The content of chemicals such as acetic acid, tannins, antioxidants, and flavonoids are potential as anti-diabetic and anticancer, because it serves in lowering blood sugar levels, free radical scavenger, helps in curing damaged pancreatic beta cells, keep the cells from oxidation and protect cells from cancer through five mechanisms. For further research, research in vitro and in vivo of salacca vinegar as an anti-diabetic and anticancer is needed.

Keywords: *Vinegar, Salacca, anti-diabetic, anticancer, tannins, flavonoids, antioxidants*

INTRODUCTION

(*Salacca zalacca*) is one of the palm species belonging to family Arecaceae spread in areas of Indonesia and Malaysia. In Indonesia, there are 18 types of Salacca that was developed in several areas, particularly in Karangasem Bali. Based on data from Department of Agriculture in Karangasem recorded 8,098,568 trees were scattered in several districts. Besides Karangasem, Tabanan is also the production center of Salacca in Bali, but the quality is not as good as Salacca in Karangasem, making it less preferred by consumers because its sour taste.

Although vinegar traditionally has been used as a food flavoring and preservative, recent investigations demonstrate the potent bioactive effects of vinegars which may benefit human health. Functional therapeutic properties of vinegar described include antibacterial activity, blood pressure reduction, antioxidant activity, reduction in the effects of diabetes, and prevention of cardiovascular disease. Other positive health effects of daily consuming vinegar reported include improving blood glucose response which would be of benefit to diabetic patients[1].

Vinegar is able to inhibit the action of enzymes that cause the absorption of glucose disakaridase result will be slower digestion and control the increase in the glycemic index[2]. In type 2 diabetes, vinegar reduces postprandial hyperglycaemia, hyperinsulinaemia, and hypertriglyceridaemia without affecting lipolysis. As a result, vinegar's effect on carbohydrate metabolism may be accounted for, at least in part, by an increase in insulin-stimulated glucose uptake, demonstrating an improvement in insulin action in the skeletal muscles[3].

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Depending on variety of vinegar and inherent acetic acid and total phenolic content, daily intake of vinegar may affect human health and metabolism[1].

A major cause of diabetes is impaired insulin secretion, insulin resistance and excess of glucose produced by our body[4]. Treatment of diabetes is often done through insulin therapy and medications oral antidiabetic (OAD), but such treatment can have negative effects, such as severe hypoglycemia, nausea, discomfort in the abdomen, anorexia and the long-term complications that can harm the brain and costs expensive so many people are trying to control their blood glucose levels with traditional treatments using natural ingredients such as fruit vinegar[5].

Based on the above exposure, so in this study will be assessed on the contents contained in salacca vinegar that has been processed by researcher together with farmer groups of Abian Salak, Sibetan village, Karangasem. Literature study is carried out to find potential vinegar as an antidiabetic and anticancer bark. The purposes of this study are (1) To describe the chemical content in fermented extract of salacca vinegar in Sibetan village, Karangasem; (2) To describe the potential of salacca vinegar to be used as antidiabetic and anticancer drugs based on chemical content.

MATERIALS AND METHOD

The type of the study is descriptive to determine the chemical content (total phenols, levels of tannins, flavonoids, antioxidant capacity, vitamin C, and acetic acid) and its potential as an antidiabetic and anticancer. Place and time of the research was conducted in farmer groups of Abian Salak Sibetan village for the production od salacca vinegar; Applied Chemistry Laboratory, Department of Medical Laboratory Technology, Health Polytechnic of Denpasar for acetic acid testing, test the total phenol, levels of tannins, flavonoids , antioxidant capacity, and vitamin C.

This study is conducted in three phases, namely the preparatory phase, implementation phase, and the data analysis stage.

(1) The preparation phase.

This phase is done by preparing tools and materials activities. Fruits as the samples obtained from farmer groups Abian Salak, Sibetan village. Sample of ripe fruits were picked at random. Other materials prepared are distilled water, sodium hydroxide (NaOH 0.1 N), oxalic acid ($H_2C_2O_4$ 0.1 N), pp indicator. Materials for testing in Laboratory been provided by a laboratory.

(2) The Process of Making Salacca Vinegar

The process of making vinegar bark is done by squeezing the fruits as much as 5 kg, in order to obtain the juice of 1 liter, and then allowed to stand for 3 months.

(3) Content Analysis of Vinegar Acid

A total of 25 mL of salacca vinegar that has been filtered, then diluted 10 times by adding distilled water up to 250 mL in a volumetric flask. Then the bark as much as 25 mL of vinegar diluted with 0.5 mL added with fenoftalein indicator (pp) and titrated with 0.1 N NaOH solution standardized with 0.1 N oxalic acid titration is stopped if there has been a change in color from clear colorless to pink. Titration done 3 times restating. Acetic acid as the total acid is calculated using the following equation.

$$\%\ Total\ acid = \left(\frac{B_{\ acetat\ acid} \cdot V_{NaOH} \cdot N_{NaOH}}{V_{acetat\ acid} \cdot 1000} \right) x\ dilution\ factor\ .x100\%$$

(4) Total Analysis of phenols, tannins, flavonoids, antioxidants, and vitamin C

Total Analysis of phenols, tannins, flavonoids, antioxidants conducted using a spectrophotometer, and vitamin C by iodometry. This examination is carried out by a laboratory in Applied Chemistry Laboratory, Department of Medical Laboratory Technology, Polytechnic Denpasar of Health.

(5) Data Analysis Phase

Data have been obtained from the results of laboratory tests manually processed and analyzed descriptively in tables and narrative with relevant literature review.

RESULTS

Results of measurements of the levels of vinegar (acetic acid) in a sample performed in chemical laboratories required 0.1 N NaOH with an average volume of 27.83 mL, *thus* obtained acidic and 6.68% . Results calculation vinegar acid levels and other chemical constituents are presented in Table 1.

Table 1. Chemical Content of Salacca Vinegar of Sibetan Village

No.	Analysis	Results
1.	Total of Fenol	27,47 mg/100 mL GAE
2.	Level of Tanin	71,69 mg/100 mL TAE
3.	Level of Flavonoid	26,51 mg/100 mL QE
4.	Antioxidants Compunds	70,21 mg/L GAEAC
5.	IC 50	103,09 mg/mL
6.	Vitamin C	4,6547 mg/100gr
7.	Total Levels of Acid	6,68 %

DISCUSSION

Results of calculation to determine the amount of salacca vinegar is 6.68%. The total acid content is higher than the content of the acetic acid bark varieties Suwaru Malang 3.49%. These levels high enough to provide benefits to consuming salacca vinegar Abian Salak, Sibetan Karangasem. Vinegar contains acetic acid that has been implicated in the regulation of blood glucose levels[6]. Salacca Vinegar Sibetan also greater than the apple cider vinegar at 4.53%[7]. The acetic acid in salacca vinegar allegedly give effect to control blood glucose by affecting the rate of gastric emptying. The results showed that a decline in the rate of gastric emptying after giving vinegar resulting darah11 control glucose levels.

Mechanism of vinegar in lowering blood glucose levels is a major component in vinegar in the form of acetic acid allegedly capable of inhibiting the action of enzymes disakaridase resulting in digestion of complex carbohydrates so that the absorption of glucose products of digestion will be slower and the increase in the glycemic index can be controlled[2]. This is reinforced by studies showing that administration of vinegar can improve insulin sensitivity, lower glucose levels pospandrial, and lowering the level of insulin resistance due to substances such as acetic acid[8,9]. The study also shows that the test results salacca vinegar contains total phenols of 27.47 mg / 100 mL or 274.7 ppm; tannins 71.69 mg / 100 mL or 716.9 ppm; flavonoid 26.51 mg / 100 mL or 265.1 ppm; and the antioxidant capacity of 70.21 mg / L (ppm). The chemical content has potential as an antidiabetic. This is based on testing in vivo in Wistar rats, treatment with the diabetes drug metformin is more effective in lowering blood glucose levels compared vinegar bark, but not better repair damaged pancreatic tissue[10].

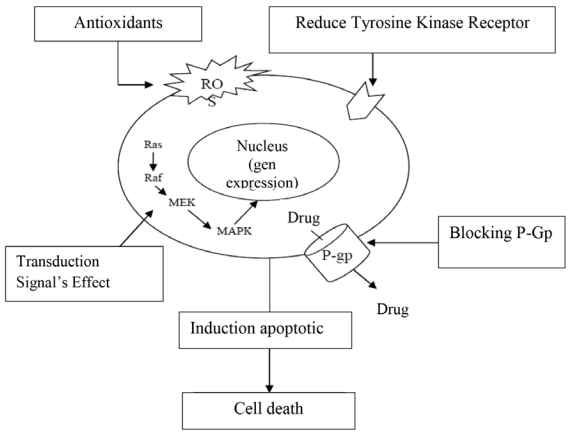
Antioxidant compound effect on a decrease in blood glucose levels for allegedly able to function as a free radical scavenger. The antioxidant activity of bark vinegar serves as a free radical scavenger which is able to reduce the reactivity of free radicals, which can lower blood glucose levels as a result of oxidative stress and prevent excessive oxidation. This inhibition can protect pancreatic beta cells from damage[10,11]. A decrease in blood glucose levels of mice allegedly caused by a combination of acetic acid, antioxidants, and a variety of other functional components such as tannins and flavonoids contained in vinegar helps repair damaged pancreatic beta cells, thereby increasing insulin secretion[6].

Flavonoids also donate a hydrogen atom to form a peroxide radical flavonoids radicals easily react with free radicals so radical chain reaction stops. The ability of polyphenol compounds in counteracting free radicals caused by its structure. In the flavonoid compound, the hydroxyl group on the aromatic ring, it will donate H atoms on the free radicals. Phenoxyl radical flavonoids formed then undergoes resonance stabilization by conjugated double bond system so that the radicals are less reactive[12]. Antioxidant compounds such as flavonoids and tannins well in anticancer function.

Polyphenols in foods can provide an anticancer effect through several mechanisms are possible, such as the elimination of carcinogenic agents, modulation signals cancer cells and enzymatic antioxidant activity and induction of apoptosis and cell cycle arrest[13,14]. Some of these effects may be related, at least in part of antioxidant activity. In recent years, a new concept of the effect of polyphenolic antioxidants in foods have emerged, namely, direct activity against reactive species and antioxidant activity indirectly; last activity is thought to arise primarily through the activation of nuclear factor-erythroid 2-related factor 2, which stimulates the activity of antioxidant enzymes such as glutathione peroxidase (GPx), glutathione S-transferase, catalase, NAD (P) H: quinone-oxidoreductase 1 (NQO1), and / or phase II enzymes.

Antioxidants are found in the bark vinegar Sibetan

village is that polyphenolic compounds flavonoids and tannins. Flavonoids are polyphenolic compounds that are known to have anticancer activity. At least five mechanisms of anticancer activity of polyphenols. First, the ability of polyphenolic antioxidants may protect cells from DNA damage by cleaning the cell from free radicals (Reactive Oxygen Species / ROS). Secondly, polyphenols modulate protein that plays a role in signal transduction pathways such as activator protein 1 (AP-1), mitogen-activated protein kinase (MAPK), phosphatidylinositol 3-kinase (PI 3'-K), p70S6-K and Akt. Third, polyphenols reduce the activity of the tyrosine kinase receptor (PDGF-Rβ, EGF-R), which plays a role in malignant proliferation of tumor cells. Fourth, polyphenols induce apoptosis in tumor cells. Fifth, polyphenols overcome multidrug resistance by blocking the P-glycoprotein efflux (P-gp) against anticancer drugs. Of the five such mechanisms play a role in the cytotoxic mechanism is by inducing programmed cell death (apoptosis) (Demeule et al. 2002). Antioxidant mechanisms in the cell can be illustrated in Figure 1.



Picture 1. The Mechanism of Antioxidants (flavonoid) as an Anticancer[15].

In food products, antioxidants can be used to prevent oxidation processes that can cause damage, such as rancidity, discoloration and aroma, as well as other physical damage. Antioxidants can be in the form of nutrients such as vitamin E and C, non-nutritional (pigment carotene, lycopene, flavonoids, and chlorophyll), and enzymes (glutathione peroxidase, coenzyme Q10 or ubiquinon). Antioxidants can be divided into three categories, namely antioxidant preventive (enzyme superoksidadismutase, catalase, and glutathione peroxidase), primary antioxidants (vitamin A, phenolics, flavonoids, catechins, quercetin), and antioxidants complementary (vitamin C, β-carotene, retinoid).

Cancer cells can propagate and spread to other cells. Antioxidants block the damaging free radicals when the cell nucleus by providing a hydrogen atom from the free radicals that antioxidants free radicals to be stable. In the cyst disease, free radicals attack the cell nucleus from an organ that is being attacked, so do the division with uncontrolled and mutated. Antioxidants work by providing hydrogen atoms to free radicals so as not to damage the cell nucleus and free radicals to be stable. Antioxidants can prevent early blood vessel damage if consumed regularly. Antioxidants capture the free radicals that are in the blood vessels to the heart so that the heart blood vessel damage does not occur[16]. Antioxidants can prevent and repair damage to the respiratory tract and lung area. Free radicals that come from cigarettes and pollutants will be captured by antioxidants that improve lung health channel. In the eye, the antioxidant will capture free radicals that enter the eye before the radical molecules oxidize lipids and proteins in the lens by binding free radicals. So that eye damage can be prevented. Antioxidants will help capture free radicals will oxidize bone cells, thus preventing damage to the bone. For hepatitis, antioxidants will help to capture free radicals, preventing the gene mutation, and repair damaged liver cells[16]. Based on this, the bark vinegar Abian Salak Sibetan village has great potential as a product resulting from the processing of fruits of economic value because of its chemical content of health benefits that anti-diabetes and anticancer.

CONCLUSION

Vinegar bark or Salacca vinegar processing results of researchers with farmers' groups Abian Salak Sibetan village Karangasem contain chemicals that total levels of acid as vinegar acid by 6.68%; total phenols of 27.47 mg / 100ml GAE, tannins of 71.69 mg / 100ml TAE, flavonoid content of 26.51 mg / 100mi QE, the antioxidant capacity of 70.21 mg / L GAEAC, IC 50 of 103.09 mg / ml, vitamin C of 4.6547 mg / 100g. The content of these chemicals such as acetic acid, tannins, antioxidants, and flavonoids potential as antidiabetic and anticancer, because of the presence of the compound can function in lowering blood sugar levels, free radical scavenger, helps improve pancreatic beta cells are damaged, keep the cells from oxidation and protect cells from cancer with five mechanism.

Conflict of Interest: All authors declare that there is no any conflict of interest within this research and

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Effect of Diaphragmatic Breathing Exercise on Peak Expiratory Flow (PEF) in Individual with Asthma

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ABSTRACT

Asthma is a chronic airway disease caused by inflammation and resulting of hypersensitivity on the airway, in which it is rising several clinical symptoms of wheezing, shortness of breath, chest pain, cough varying over time, along with limited of the expiration airflow. As a result, asthma cause difficulties during expiration and responsible for the decreasing of the Peak Expiratory Flow (PEF). This study aimed to analyze the effect of diaphragmatic breathing exercise towards Peak Expiratory Flow of asthma patient during an acute episode. The research design is pre-experimental with one group pre-post-test with 20 samples which was collected by using purposive sampling method. This research was conducted in April 2017. The result of the study showed mean of PEF pretest was 73,05% and post-test was 77,67%. It can be concluded that diaphragm breathing exercises give impact to the PEF of asthma patients.

Keywords: *diaphragmatic breathing exercises, peak expiratory currents, asthma*

INTRODUCTION

Asthma is a chronic disease of the airway caused by inflammation. Such condition causes hypersensitivity throughout the airway resulting in clinical symptoms of wheezing, shortness of breath, chest tightness and cough varying over time, and followed by the limitation of expiratory airflow (1). WHO reported there are 235 million people worldwide suffer from asthma. The rate is estimated to increase about 400 million cases by 2025. Asthma is a major problem for public health in many countries, especially for those 67 with low-income status[1-3]. Recently, research has stressed that some patients might have 68 clinical features of both asthmas, 69 particularly adult smokers with high reversibility of airflow obstruction and bronchial or 70 systemic eosinophilic inflammation[4-5]. According to Basic Health Research (Riset Kesehatan Dasar; Riksdag) in 2013, the prevalence of people with asthma in Indonesia has increased by 1%. The prevalence of asthma in Bali in 2013 was the sixth highest rank among another disease which affecting 6.2 per 1000 population[6]. The data found at Emergency Room of Mangusada Badung Hospital stated that asthma was the highest-ranking disease and continues to increase since 2013 to 2015. The number of patients with asthma attacks respectively since 2013 to 2015 was 1.094, 1.112, and 1.512 people with major complaints of spasms breath.

The spasm breath in asthma patients results from the occurrence of airway obstruction. Hyperactivity reactions cause narrowing of the airways and will result in difficulties during expiratory[7]. The difficulties of expiration in asthmatic patients can be assessed objectively by measuring the value of PEF (Peak Expiratory Flow)[8]. The exercise that can be done to increase expiratory air is diaphragmatic breathing exercises[9]. Diaphragmatic breathing exercise is a breathing exercise performed with maximal inspiration through the nose, mainly focus on the abdominal movement, restricting the chest movement and exhale through the mouth, can improve the performance of the abdominal muscles that play a role in the expiratory process[10]. This study aimed to determine the effect of diaphragmatic breathing exercises on peak expiratory currents in asthma patients at the Mangusada Badung Hospital in 2017.

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MATERIALS AND METHOD

The present study is a pre-test post-test pre-experimental research. The sample was sorted out of the population using purposive sampling method and 20 people met the inclusion criteria. This study was conducted from March to April 2017. Peak flow meter was used to measure the peak expiratory rate. The measurements prior to treatment (pre-test) were performed five minutes after nebulization and measurements after treatment (post-test) were performed five minutes after administration of diaphragmatic breathing exercises. The patients were given diaphragmatic breathing exercises in this study only once for six minutes.

RESULTS AND DISCUSSION

Before the results of the study are presented, the characteristics of research subjects by sex, age, and height will be described in the following table.

Table 1. Characteristics of Respondents by Sex

Sex	Frequency (f)	Percentages (%)
Male	13	65
Female	7	35
Total	**20**	**100,00**

The result of the analysis was found that most respondents were male (13 respondents) (65%).

Table 2. Characteristic of Respondents by Ages

	Mean	SD	Min-Maks	95% CI
Ages	48,8	4,3	26–70	42,1 - 55,4

The mean of age of the asthmatic respondents was 48.8 years (95% CI: 42.1-55.4), the standard deviation was 14.3 years. The youngest respondent was 26 and the oldest was 70 years old. The 95% of interval estimation was believed that the mean age of asthma patients was between 42.1 to 55.4 years old.

Table 3. Characteristics of Respondents Based on Height

Variable	Mean	SD	Min-Mak	95% CI
Heigh	164,3	5,8	152 – 172	161,6 - 167

The average respondent height was 164.3 cm (95% CI: 161.6 - 167), with standard deviation was 5,77 cm. The lowest body height was 152 cm and the highest was 172 cm. The 95% interval estimation was believed that the average height of respondents is 161.6 to 167 cm.

The results of this study showed an average of PEF before treatment was 73.05%. This value indicates the PEF in asthma patients before the intervention was low or below the normal value of PEF (80-100%). The low PEF in asthma patients was triggered by airway obstruction[11]. The airway obstruction of the asthmatic patient was evoked by the spasm of the airway thus the patient had airflow disorder especially during expiration[7]. In addition, the declining rate of PEF was also influenced by patient's age. The more mature of a person may be more susceptible to have disruption at the respiratory system. Such condition will generate a disruption to the lung function including disturbance in the peak flow expiration of the patient.

The mean of PEF respondents after given diaphragmatic breathing exercise was 77.67%. The results of this study showed there was an improvement in PEF after obtaining respiratory training. A related study done by Natalia[12] suggest that breathing exercises may increase PEF in patients with asthma. The positive effect of PEF was related to the effectiveness of air released during expiration. The releasing of air during expiration can be maximized using respiratory muscles correctly, with diaphragmatic breathing exercises[9], but still below to the normal PEF value, 80-100%. The minimum effect was related to the frequency of exercise that is only once for six minutes thus the increase of PEF did not reach the normal value of PEF.

The difference in means between PEF before treatment and after treatment was 4.61%. A paired sample t-test with p-value 0.001 (α=0,05) was performed to test the hypothesis, as a conclusion, diaphragmatic breathing exercise took effect on the peak expiratory flow in asthma patient at Emergency Department Mangusada Badung Hospital.

The results of this study indicated that diaphragmatic breathing exercises could take effect on the peak expiratory flow in patients with asthma who was experiencing obstruction or obstruction of the airway. The diaphragmatic breathing exercises maximized the release of air during expiratory by reducing intrathoracic

volume using abdominal muscles. The abdominal muscle was deflated and strongly pushing the abdomen inward, pushing the diaphragm in a resting state. This allows the releasing of air that exceeds the capacity during normal expiration in asthmatic patients.

The results of this study appear to be related to the theory that asthma patients have difficulty during exhaling, consequently, peak expiratory flow decrease and require extra strength to perform expiration. In normal circumstances, expiration is a passive process because it occurs due to elastic pulmonary shrinkage as inspired muscles relax without requiring muscle contraction or releasing of energy[11].

Diaphragmatic breathing allows for active expiration to unload the lungs more fully and faster than expiration during normal breathing using the abdominal muscles. To perform active or forced expiratory, the abdominal muscles should contract to further reduce the volume of the thorax and lung. When the muscles of the abdomen are contracted, the intra-abdominal pressure is increasing, resulting in an upward force on the diaphragm, causing the diaphragm is lifted into the thorax cavity compared to the rest position. Therefore, the vertical size of the thorax cavity is shrinking and lung volume is decreasing[13]. Intra alveolar pressure is increased because the air inside the lungs is placed in smaller volumes[14]. The difference between intra-alveolar and atmospheric pressure becomes greater compared to the passive expansion, hence more air comes out of the lungs [11] resulting in an increase in peak expiratory flow[15].

Related research that supports the results of this study is a study by Widarti[16] which states that diaphragmatic breathing can improve the quality of life of asthma patients because it can train people to breathe the proper way by using stomach breathing[17]. The effectiveness of diaphragmatic breathing exercises is also supported by related research conducted by Mayuni[18] which states that diaphragmatic breathing affects the vital capacity of the lungs in asthmatics.

The researchers agreed that diaphragmatic breathing exercises can help to train the asthma patients to breathe by prioritizing and maximizing the use of diaphragm muscles and abdominal muscles during respiration, where it can increase the air outflow, therefore such procedure can increase the peak expiratory flow in asthma patients. Such thing could minimize the carbon dioxide trapped in the alveoli resulting in diffusion and respiratory failure. In addition, diaphragmatic breathing exercises are not only maximizing expiration and increasing peak expiratory flow but also maximizing inhalation of air during inspiration with the use of diaphragm muscles and abdominal muscles so that ventilation process runs optimally[19].

CONCLUSION

The conclusions from the result that the mean of peak expiratory flow prior to diaphragmatic breathing exercises was administered was 73.05% after given diaphragmatic breathing exercises were 77.67%. The diaphragm respiratory exercise plays a vital role to the peak expiratory flow with the difference in mean between PEF before treatment and after treatment was 4.61% with 2.26% of standard deviation and p-value (Sig. 2-tailed) 0.001 (p-value <0.05).

Conflict of Interest: All authors declare that there is no any conflict of interest within this research and publication including the financial agency.

Ethical Clearance: Obtained from the university committee and respondent agreement

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The Effect of Internet Addiction on the Academic Performance of Undergraduate Nursing Students

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ABSTRACT

Internet addiction has been identified as a significant public health threat. The problems that associate with computer use meet the criteria for an addiction; therefore, it is recommended that internet addiction to be included in the Diagnostic and Statistical Manual of Mental Disorders (DSM) as a mental illness. Measuring the prevalence of internet addiction among the undergraduate nursing students and the association with students' academic performance are the objectives of this study. This quantitative study using a cross-sectional design to measure the prevalence of internet addiction disorder among undergraduate nursing students. A probability sample of consenting undergraduate nursing students (N = 100). About (45%) of nursing students were symptomatic for internet addiction. A significant correlation was found between students' academic performance and internet addiction (P = > 0.05). Regarding students' demographics, a significant correlation was found only between study stage and internet addiction (t = -.242, P = 0.015); in which that freshman and sophomore student at higher risk than junior and senior students. Nursing students spend more time on school works than non-academic internet related activities; however, they are at higher risk for internet addiction. Therefore, it is recommended that conducting educational programs should be conducted focusing on the problematic use of internet to increase students' awareness toward internet addiction.

Keywords: *Internet addiction, nursing students, problematic use of internet*

INTRODUCTION

In some countries that support education and research, internet addiction has been identified as a significant public health threat. The problems that associate with computer use meet criteria for an addiction; therefore, it is recommended that internet addiction should be considered as a mental disorder and included in the Diagnostic and Statistical Manual of Mental Disorders (DSM). Despite the increasing number of research studies that target different mental health issues in the developing countries and the availability of the treatment for mental disorders in different settings, there has been no formal treatment or serious governmental response to the issue of internet addiction [1]. The behavior of spending many hours working on a computers or other devices doing non-work technology-related activities, such as playing on internet, social media, or videogames has been on debate to find the best classification for such behavior. Individuals who loss the ability to control or decrease the time they spend on advanced technology and internet usually experience changes in their mind. Some studies consider the behavior of spending many hours on non-work technology-related activities as an impulse control disorder (American Society of Addiction Medicine, 2011) [2]. On the other hand, withdrawal symptoms when not engaged in such behavior, a continuation of the behavior despite a family conflict, and the need for new game or more time on internet to achieve the desired mood are considered as symptoms of addiction. These symptoms negatively impact several humans'

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life aspects; diminishing social life and poor academic performance are consequences of internet addiction [3]. This study aims to measure the prevalence of internet addiction among the undergraduate nursing students and determine the effect of internet addiction students' academic performance. Recently, the American Society of Addiction Medicine (2011) [2] defines addiction as a chronic brain disorder, and officially proposed that addiction is not limited to substance use. Cash et al., (2012) [1] stated that "all addictions, whether chemical or behavioral, share certain characteristics including salience, compulsive use (loss of control), mood modification and the alleviation of distress, tolerance and withdrawal, and the continuation despite negative consequences" (p. 293). The prevalence of internet addiction disorder is varied from one country to another, but the reported rate is between 3% and 38%. According to Cash et al., (2012) [1] and Beard (2005) [3], five diagnostic criteria are required to appropriately diagnose internet addiction. These criteria are: 1) An individual is preoccupied with the internet (thinks about previous online activity or anticipate next online session); 2) needs to use the internet with increased amounts of time in order to achieve satisfaction; 3) an individual has made unsuccessful efforts to control, cut back, or stop Internet use; 4) an individual is restless, moody, depressed, or irritable when attempting to cut down or stop Internet use; 5) has stayed online longer than originally intended. In addition to the aforementioned criteria, the author also adds that at least one of the following criteria must be present in order to diagnose an individual with internet addiction. 1) Significant relationship, educational, and job opportunity are threatened because of the Internet; 2) the person has lied to family members, therapist, or others to hide the amount of engagement with the internet; 3) uses the internet as a way of escaping from problems or of relieving a dysphoric mood, such as feelings of helplessness, guilt, anxiety, or depression [3].

Etiology of Internet Addiction

Neurobiological Theory: Addiction activates some neurotransmitters and the reward system in the brain to produce leasing effects [4]. When the release of dopamine, opiates, and other neurochemical substances activated, overtime they associated receptors with these neurochemicals are desensitized and develop tolerance, which mean that regular amount of time is not enough to produce the same pleasing effect "high". Therefore, an individual needs to overstimulate the reward center by increasing the time spending on internet related activities. Such behavioral patterns are also needed to avoid withdrawal symptoms [5].

Reinforcement/Reward Theory: Individuals who use digital technology usually experience multiple levels of reward when they use different computer applications. The Internet does similar to gambling; both function on a variable ratio reinforcement schedule (VRRS) [6]. In other words, a variable-ratio schedule is a schedule of reinforcement where a response is reinforced after an unpredictable number of responses (e.g. gambling, internet, and lottery) [7].

Biological Theory: A large group of research have indicated that addictive behaviors have genetic predispositions. Persons with a genetic predisposition have less number of dopamine receptors than normal people or lower concentration of serotonin and dopamine. Consequently, individuals will have difficulty experiencing normal levels of pleasure in activities that most people would find rewarding. Therefore, increasing pleasure requires individuals to "seek greater than average engagement in behaviors that stimulate an increase in dopamine, effectively giving them more reward but placing them at higher risk for addiction" [1].

METHOD

Population and Sampling Plan

This quantitative study using a cross- sectional design to measure the prevalence of internet addiction disorder among undergraduate nursing students. The target population was both male and female students who were studying at the University of Babylon, College of Nursing (morning and evening program). Probability sample of consenting undergraduate nursing students (N = 100). Participants were selected through the period of two weeks, from 1st to 15th of February, 2017.

Ethical Considerations

Students were asked for a voluntary participation. After students agree to be a part of the study, they were informed about the purpose, benefits, risks, and procedures of the study. To maintain participant privacy, students were received anonymous questionnaire and informed that their information would be used for research purpose only.

Instrument Selection

The questionnaire that is used in the current study contains two parts; the first part includes the students' demographic information. The second part includes the Internet Addiction Scale (IAS). The IAS was adopted and modified from the study done by Cho et al., (2014) [8]. The tool contains 16 items, and the total items are scored and rated on three levels Likert scale; "1=never; 2= sometimes; 3= always. A student who gets a means score of 2 or higher is considered to have internet addiction disorder.

Data Analysis

Data was analyzed using SPSS software. Descriptive analysis was used to measure the prevalence of internet addiction. Independent Samples t-Test was also used to find the differences between male and female students. The Correlation analysis was computed to find the relationship between internet addiction and students independent variables.

Table 1. Descriptive statistics of students' demographical data

Demographic data		Frequency	Percent
gender	Male	42	42.0
	Female	58	58.0
	Total	100	100.0
Study Time	Morning Studies	49	49.0
	Evening Studies	51	51.0
	Total	**100**	**100.0**
Stage	First Stage	23	23.0
	Second stage	15	15.0
	Third Stage	32	32.0
	Fourth Stage	30	30.0
	Total	**100**	**100.0**

Table 2. Descriptive statistics of internet addiction

Internet Addiction	Frequency	Percent
Asymptomatic for Internet Addiction	57	57.0
Symptomatic for Internet Addiction	43	43.0
Total	**100**	**100.0**

Table 3. Correlation between students' demographic data and internet addiction

Demographical Variables		Gender	Study Time	Stage
Internet Addiction	Pearson Correlation	-.169	.157	-.242*
	Sig. (2-tailed)	.093	.120	.015
	N	100	100	100
	*. Correlation is significant at the 0.05 level (2-tailed).			

RESULTS AND DISCUSSION

The study results are represented in three tables. First table explains participants' demographical information. Table two describes the prevalence of internet addiction among nursing students. The last table describes the relationships between internet addiction and independent variables. The study results (table 2) indicate that (43%) of nursing students were symptomatic for internet addiction. This result supports the available research studies that measure the prevalence of internet addiction among university students. In 2013, Salehi et al., (2014) [9] conducted a study measuring the prevalence of internet addiction among medical students in Mashhad. Authors found low rate of prevalence of addiction; however, authors indicated that their study population might be at higher risk since the prevalence of internet addiction is rapidly increasing worldwide. The study by Chaudhari et al., (2015) [10] showed higher prevalence rate than the rate of the recent study. Authors found that the prevalence of internet addiction among medical students to be 58.87% (mild – 51.42%, moderate –7.45%). Among nursing students, Khalil et al., (2016) [11] concluded that nursing students are experienced moderate to severe levels of Internet addiction without any impact on their academic performance. The correlational analysis (table 3) displays the relationship between internet addiction and students' demographical information. It shows that there is a relationship between study stage and internet addiction (t = -.242, P = 0.015). However, there was no significant correlation between gender groups, study time, and internet addition with ($p.$ > 0.05). Result revealed that freshman and sophomore are at higher risk for internet addiction than junior and senior students. This result conflicted with the study done by Khalil et al., (2016) [11]. Authors mentioned that the rate of internet

addiction of freshman is significantly lower than that of sophomore and junior. Al□Gamal et al., (2016) [12] have highlighted that students with problem solving skills are at lower risk for internet addiction. Therefore, since 1st grade nursing students have not yet use problem solving, they might be at higher risk for internet addiction. This explanation might be the most appropriate to describe the correlational results of the recent study.

CONCLUSION

Despite the fact that nursing students spend more time on school works than non-academic internet related activities; however, they are at higher risk for internet addiction. Problem solving approaches that students learn through school educational program help students avoid the problematic use of internet. Therefore, the more advance the students go in their educational program, the less likely the risk would occur.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Mental Health Nursing, College of Nursing, University of Babylon, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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Self-Care Maintenance of Heart Failure Patients in Babylon Teaching Hospitals

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ABSTRACT

Heart failure (HF) is currently one of the major public health problems in world, and its complex and gradual nature often results in reverse proceedings, such as high rate of rehospitalization and mortality, which could be reduced if there were appropriate self-care, therefore, Self-care is one of the most significant aspects of the treatment of patients with heart failure through using special activities to reduce and relieve symptoms and maintain and promote health in patients. Quantitative research, descriptive design cross sectional study Non-probability purposive sample consisted of (100) heart failure patients who admitted to the Babylon teaching hospitals were selected .The finding out of the study show most of the patient with heart failure have moderate self-care management a high significant difference between the self-care ability and their body mass index levels. a significant difference between this disease and their chronic diseases, hypertension, diabetes mellitus and duration of disease.

Keywords: *self-care, management, heart failure patients, Babylon teaching Hospitals*

INTRODUCTION

Cardiovascular disease are currently certain concerning the nearly common chronic illnesses in elderly then middleaged people or also the governmentmotive about hospitalization of older humans. Heart failure disease is the almost common disease amongst the different kinds of cardiovascular disorder 1. On a world scale, they are viewed as a difficult problem in health status 2. New surgical and medical treatment modalities hold increased the age in patients with cardiovascular disorder this improved the general rate of incidence over this disorder 3. This disorder can durability remain considered a pathophysiological state. In this disease, cardiac dysfunction renders that disabled to pump adequate blood to tissues, unless at that place is an abnormal rise among the ventricular diastolic volume. The latest records of the World Health Organization declared that, greater than 80% over cardiovascular illnesses happened among low-and moderate-income countries. The records additionally indicated as nearly half of cardiovascular illnesses among these nations happen within the youth group who were under 70 years old and about a quarter of cases happened among the age group under 60 years. The excellent factor is as until the youth who were 40 years, the danger about heart illnesses among men is double that within women 4. In many country according to the latest statistic, cardiovascular illnesses are account greater than 38% (or about 50%) regarding morbidities and mortalities. Predictions recommend that through 2020 cardiovascular illnesses will have been the reason of greater than 75% over mortalities or morbidities in level of world 5. Several research have proven as contextual elements hold an essential function among the incidence regarding heart failure. For example, a study carried out at the California University indicated that age, gender, and hypertension are associated together with this disease. A study into Switzerland demonstrated an association among age, gender, then blood pressure and the occurrence of diabetes or heart failure. Many studies pointed out the relationship in perceived social support and this disease. Most cardiovascular danger elements are associated

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with the behavior and awareness. Therefore, one over the almost essential therapeutic measures among these patients is work done self-care behaviors. According to" Orem's definition,of self-care" is a regulatory function into human beings primarily based on the individual's ability according to function self-care practices on themselves 6. "Self-care is defined as a coping strategy against life events and stresses triggered by an increase in the pro¬cess of aging and dependence". self-care includes specific things to do to minimize or relieve some signs and symptoms. Self-care is, therefore, certain of the almost significant factors of the remedy in patients along heart failure and consists of things to do certain as daily weight measurement; contacting a health practitioner observing a swelling concerning the ankle, legs, foot, and abdomen; wight cautious about the total of each day urine; regular con-sumption concerning medicines so directed by a physician; then refraining from consuming too much fluids 7.

ATERIALS AND METHOD

A descriptive cross sectional study is conducted in Babylon teaching hospitals (merjan teaching hospital, Alhilla teaching hospital). This study is carried out to find out the self-care abilities of heart failure patients in Babylon teaching hospitals. It started from 1st November 2016 to 20 June 2017. A questionnaire is developed and adopted after completing review of literature and articles review which were concerning to this field. The instrument of this consist from three parts. Information are gathering by completing the interview with each patients who was included in the study. The researcher take the agreement from each patient to participant in the study and clarified the study questionnaire. Each interview took approximately 15-20min. data collect are carried out from 10 march 2017 to 15 April 2017.

Table 1. Shows the Frequency of the patients demographics data

Gender		Frequency	Percent
	Male	52	**52.0**
	Female	48	48.0
	Total	100	100.0

Cont... **Table 1. Shows the Frequency of the patients demographics data**

Age		Frequency	Percent
	35-40 years	2	2.0
	41-45 years	7	7.0
	46-50 years	7	7.0
	51-55 years	7	7.0
	56 years and more	77	77.0
	Total	100	100.0
Educational level		**Frequency**	**Percent**
	Cannot read and write	61	61.0
	Able to read and write	6	6.0
	Primary school	12	12.0
	Intermediate school	15	15.0
	Secondary school	2	2.0
	Institutes or College	4	4.0
	Total	100	100.0

Table 2. Shows the Frequency of the patients according to Occupation, Residency and Marital status.

Occupation		Frequency	Percent
	Employer.	12	12.0
	Unemployed.	27	27.0
	House Wife	21	21.0
	Retired.	40	40.0
	Total	100	100.0
Residency		**Frequency**	**Percent**
	Rural	63	63.0
	Urban	37	37.0
	Total	100	100.0
Marital status		**Frequency**	**Percent**
	Single	5	5.0
	Married	74	74.0
	Divorce	21	21.0
	Total	100	100.0

Table 3. Body mass index

BMI	Frequency	Percent
Underweight	4	4.0
Normal	33	33.0
Overweight	37	37.0
Obese	20	20.0
Over obese	6	6.0
Total	**100**	**100.0**

Table 4. Self-care management

Self-care abilities	Never		Some times		Always		Mean	S. D	Assessment
	F	%	F	%	F	%			
1.Weight yourself	96	96	2	2	2	2	1.06	.312	Mild
2.Checking the ankles for edema	45	45	24	24	31	31	1.86	.865	Mild
3. avoiding the sick people who have flu	34	34	44	44	22	22	1.88	.742	Mild
4.Do some physical activity such as shopping	48	48	34	34	18	18	1.70	.759	Mild
5.Keep doctor or nurse appointments	3	3	34	34	18	18	2.59	.552	Moderate
6.Eat a low salt diet	3	3	35	35	62	62	2.11	.898	Moderate
7.Exercise for 30 minutes	54	54	26	26	20	20	1.66	.794	Mild
8.Forget to take your medicines	19	19	22	22	54	54	2.40	.791	Moderate
9.low salt eating in vesting or eating out home	28	28	43	43	29	29	2.01	.759	Moderate
10.How quickly recognize a symptoms of heart failure	22	22	31	31	47	47	2.25	.796	Moderate
11.Are you able to work	68	68	23	23	9	9	1.41	.653	Mild

RESULT AND DISCUSSION

Table 1 showed the demographical characteristic of study sample, related Table (1) showed that most of the patient were male (52%) their highest age was more than 56 years old .the majority of sample were cannot read and write (61%) and the lowest percentage of them had secondary school graduated (2%) , while (40%) of them were retired and (63%) lived in rural area ,however the majority of them were married and (5%) were single**.** Table (2) showed that the highest percentage (37%) of the study sample had over weight, while (20%) of them were obese and the lowest percentage (6%) were over obese. In the table (1) the result showed that the male patients were the highest percentage (52%) while the females were (48%). this result comes along with Strömberg et al. (2003) [8]. and He et al. (2001) [9]. They mentioned that male is the dominant gender for patients with heart failure. This will lead to the fact that heart failure is more common in male than female. Regarding the age of patients participates in this study the age group which were effected with heart failure were above (56) years. In addition this result is consisted with study carried out by Hou et al. (2004) [2]. They declared that almost half of cardiovascular diseases in many countries occured in the age group below 70 years and about a quarter of cases occur in the age group below

60 years. The interesting point is that patient age more than 40 years was considered the risk of heart diseases in men is twice that in women. The educational level according to the finding of this study indicate (61%) of that participants patients who cannot read and write this percentage is agreement with Barbareschi et al. (2011) [10]. This study illustrated that the Patients with low educational levels reported the worst physical and functional condition. High-educated patients improved more than the other patients in functional limitations related to emotional problems over time. Low-educated patients may require different levels of intervention to improve their physical and functional condition, however the patient with good knowledge can depended on himself in caring and follow the health care team advice. The current study reported that 40% of patients were retired and they didn't have any work ,this result was agreed with (Carlson et al 2001) [11] most of the retired patients was had change in their physical statues and their Abilities in performing every day activities in addition more than half of the patients (63%) lived in rural area this result come along with the study Moser et al. (2015) [12] The patients in rural area were following an unbalanced diet and had lack of health awareness of heart disease. this considered one of the main reasons for the high incidence of heart failure in rural areas therefore People in rural areas need educational programs about heart disease and how to prevent them and avoid factors that increase the chance of disease. In addition this study revealed that most patients with HF who were married with a low socioeconomic status. In addition, the body mass index of heart failure patient (Table 3) revealed that (37%) were overweight this finding is consisting with other study which reported overweight and obesity were associated with increased risk of heart failure, therefore overweight may be a reason of hypertension and atherosclerosis that lead to ischemic heart disease and heart failure. The finding of this study present that the most of the patients had moderate responses to the self-care maintenance (Table 4). These findings are similar to those of other studies such as (Tung et al 2012) [13], showing that low levels of physical activity and lack in weighting self are common among HF patients, despite possible cultural differences. "The results of Muzzarelli's study in 2010 [14] showed more than 25% of patients with heart failure did not follow the medical treatment" Muzzarelli (2010) [14] "In the study, the least self-care were related to controlling daily weight, and exercising. The results of [15] also showed that the least rate of adherence to self-care behaviors belonged to daily weighing. Although daily weighing is one of the recommended self-care behaviors, this behavior is hardly adhered to even in patients with severe symptoms. One of the reasons behind ignoring daily weighing is the patients' misunderstanding about this matter, they think that controlling weight is only for examining overweight, and they do not have enough awareness of its application in examining the body fluid

CONCLUSION

Most of the patient with heart failure have moderate self-care management a high significant difference between the self-care ability and their body mass index levels. A significant difference between this disease and their chronic diseases, hypertension, diabetes mellitus and duration of disease.

Financial Disclosure : There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Adult Health Nursing, Faculty of Nursing, University of Babylon, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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Bioactive Chemical Analysis of *Enterobacter aerogenes* and Test of its Anti-fungal and Anti-bacterial Activity and Determination

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ABSTRACT

Enterobacter is a genus of Gram-negative, rod shaped, facultative anaerobic, and non-spore forming microbes of family *Enterobacteriaceae*. *Enterobacter aerogenes* (*E. aerogenes*) is well known opportunistic bacteria emerged as nosocomial pathogen in intensive care unit patients. The objectives of our research were analysis of the secondary metabolite products and evaluation antimicrobial activity. Twenty seven bioactive compounds were identified in the methanolic extract of *Enterobacter aerogenes*. GC-MS analysis of *Enterobacter aerogenes* revealed the existence of the Butanoic acid , 3-methyl, 2,6-Lutidine-4-[benzyloxy]-3,5-dichloro, 1-Propaneamine , 3-(methylthio), Butoxyacetic acid, 3-Hydroxy-2-methylthio-3-phenylpropanoic acid, 1-Deoxy-d-arabitol, Benzeneethanamine, 2-Butanamine , (S), Thiazole , 2-amino-5-methyl, Thiophene , 2,5-bis(1,1-dimethylethoxy), Propanedinitrile , 2-bis(3,3-dimethyl-2-oxobutylthio), Carbamic acid , hydroxyl-,ethyl ester, 3-Aminopiperidin-2-one, dl-Cystathionine, Ethanol , 2-(diethylamino)-,N-oxide, 2,4-Heptadien-6-yn-1-ol , (E,E), Xanthine , 1,3-dipropyl-8-[4-[β-[(benzyloxycarbonyla, Isoquinoline ,1-ethyl and Cyclohexanecarboxylic acid , 2-phenylethyl ester. *Coriandrum sativum* was very highly active (6.75±0.22) mm. The results of anti-fungal activity produced by *Enterobacter aerogenes* showed that the volatile compounds were highly effective to suppress the growth of *Candida albicans* (5.717±0.18).

Keywords: *GC-MS, Secondary metabolites, Anti-fungal, Enterobacter aerogenes.*

INTRODUCTION

Enterobacter, (genus *Enterobacter*), any of a group of rod-shaped bacteria of the family Enterobacteriaceae. *Enterobacter* are gram-negative bacteria that are classified as facultative anaerobes, which means that they are able to thrive in both aerobic and anaerobic environments [1-3]. *Enterobacter* species are responsible for high morbidity and mortality rate in recent years due to nosocomial infections and other health care settings. Due to extended resistance of Gram-negative bacteria against almost all antibiotics, early initiation of drug therapy is required, nowadays colistin, and polymyxin antibiotic have been preferred as an alternative drugs against Gramnegative pathogens [4]. *Enterobacter* are ubiquitous in nature; their presence in the intestinal tracts of animals results in their wide distribution in soil, water, and sewage. They are also found in plants. In humans, multiple *Enterobacter* species are known to act as opportunistic pathogens (disease-causing organisms), including *E. cloacae*, *E. aerogenes*, *E. gergoviae*, and *E. agglomerans*. Pathogenic *Enterobacter* can cause any of a variety of conditions, including eye and skin infections, meningitis, bacteremia (bacterial blood infection), pneumonia, and urinary tract infections [5-9]. Despite several new drug discoveries of broad spectrum drugs or combination therapies, associated toxicities are still a serious complication. Nosocomial infections are

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the most frequent type of *Enterobacter* infections, but community-acquired infections are sometimes observed [10-16]. Recently, an alternate treatment therapy approach called biofield healing therapies or therapeutic touch is reported with effectively inhibiting the growth of bacterial cultures. The aims of our study were analysis of the secondary metabolite products and evaluation antimicrobial activity.

MATERIALS AND METHOD

Detection of secondary metabolites by Gas chromatography – Mass Spectrum

The mixture was incubated at 4ºC for 10 min and then shook for 10 min at 130 rpm. Metabolites was separated from the liquid culture and evaporated to dryness with a rotary evaporator at 45ºC. The residue was dissolved in 1 ml methanol, filtered through a 0.2 µm syringe filter, and stored at 4ºC for 24 h before being used for gas chromatography mass spectrometry [17-23].

Materials of Plants Collection and Preparation

In this study, the leaves were dried at room temperature for ten days and when properly dried the leaves were powdered using clean pestle and mortar, and the powdered plant was size reduced with a sieve [24-32]. The fine powder was then packed in airtight container to avoid the effect of humidity and then stored at room temperature.

Spectral analysis of bioactive natural chemical compounds of *Enterobacter aerogenes* using (GC/MS)

Analysis was conducted using GC-MS (Agilent 789 A) equipped with a DB-5MS column (30 m×0.25 mm i.d., 0.25 um film thickness, J&W Scientific, Folsom, CA). The oven temperature was programmed as for the previous analysis [33-39]. Helium was used as the carrier gas at the rate of 1.0 mL/min. Effluent of the GC column was introduced directly into the source of the MS via a transfer line (250oC). The components were identified by comparing their retention times to those of authentic samples of WILEY MASS SPECTRAL DATA BASE Library [40-44].

Determination of antibacterial and antifungal activity

The studied fungi, *Candida albicans*, *S. cerevisiae, Fusarium sp.*, *Mucor sp.*, *Penicillium expansum, Trichoderma viride*, and *Trichoderma horzianum* were isolated and maintained in potato dextrose agar slants. Spores were grown in a liquid culture of potato dextrose broth (PDB) and incubated at 25ºC in a shaker for 16 days at 130 rpm [45-48]. The extraction was performed by adding 25 ml methanol to 100 ml liquid culture in an Erlenmeyer flask after the infiltration of the culture. Methanol was used as solvent control. Amphotericin B and fluconazole were used as reference antifungal agent.

Data analysis

All the measurements were replicated three times for each assay and the results are presented as mean ± SD and mean ± SE.

RESULTS AND DISCUSSION

Gas chromatography and mass spectroscopy analysis of compounds was carried out in methanolic extract of *Enterobacter aerogenes*, shown in **Table 1.** Peaks were determined to be Butanoic acid , 3-methyl, 2,6-Lutidine-4-[benzyloxy]-3,5-dichloro, 1-Propaneamine , 3-(methylthio), Butoxyacetic acid, 3-Hydroxy-2-methylthio-3-phenylpropanoic acid, 1-Deoxy-d-arabitol, Benzeneethanamine, 2-Butanamine , (S), Thiazole , 2-amino-5-methyl, Thiophene , 2,5-bis(1,1-dimethylethoxy), Propanedinitrile , 2-bis(3,3-dimethyl-2-oxobutylthio), Carbamic acid, hydroxyl-,ethyl ester, 3-Aminopiperidin-2-one, dl-Cystathionine, Ethanol , 2-(diethylamino)-,N-oxide, 2,4-Heptadien-6-yn-1-ol , (E,E), Xanthine , 1,3-dipropyl-8-[4-[β-[(benzyloxycarbonyla, Isoquinoline ,1-ethyl and Cyclohexanecarboxylic acid , 2-phenylethyl ester. *Enterobacter aerogenes* produce many important secondary metabolites with high biological activities. Based on the significance of employing bioactive compounds in pharmacy to produce drugs for the treatment of many diseases, the purification of compounds produced by *Enterobacter aerogenes* can be useful. Maximum zone formation against *Candida albicans* (5.717±0.18) mm, **Table 2**. In agar well diffusion method the selected medicinal plants (*Rosmarinus oficinalis*, *Citrullus colocynthis*, *Althaea rosea*, *Coriandrum sativum*, *Origanum vulgare*, *Urtica dioica*, *Foeniculum vulgare*, *Ocimum basilicum*, *Achillea millefolia*, *Medicago sativa*, *Celosia argentea, Apium graveolens*, *Brassica rapa*, *Cichorium endivia*, *Malva sylvestris*, *Citrus sinensis*, *Ruta graveolens*, *Thymus*

vulgaris, *Passiflora caerulea*, *Glycine max*, *Brassica oleracea*, *Olea europaea*, *Calendula officinalis*, *Taraxacum officinale*, *Borago officinalis, Sambucus nigra*, *C. morifolium*, *Equisetum arvense*, and *Portulaca oleracea*) were effective against *Staphylococcus aureus*, **Table 3**. *Coriandrum sativum* was very highly active (6.75±0.22) mm against *Enterobacter aerogenes*.

Table 1. Major chemical compounds identified in methanolic extract of *Enterobacter aerogenes*.

Serial No.	Phytochemical compound	RT (min)	Molecular Weight
1.	Butanoic acid , 3-methyl-	3.396	102.0680795
2.	2,6-Lutidine-4-[benzyloxy]-3,5-dichloro	3.671	281.03742
3.	1-Propaneamine , 3-(methylthio)-	3.980	105.06122
4.	Butoxyacetic acid	4.186	132.078644
5.	3-Hydroxy-2-methylthio-3-phenylpropanoic acid	4.409	212.050715
6.	1-Deoxy-d-arabitol	4.695	136.073559
7.	Benzeneethanamine	5.187	121.0891495
8.	2-Butanamine , (S)-	5.393	73.0891495
9.	Thiazole , 2-amino-5-methyl-	5.582	114.0251694
10.	Thiophene , 2,5-bis(1,1-dimethylethoxy)-	6.669	228.118401
11.	Propanedinitrile , 2-bis(3,3-dimethyl-2-oxobutylthio)	6.766	338.11227
12.	Carbamic acid , hydroxyl-,ethyl ester	7.115	105.042593
13.	3-Aminopiperidin-2-one	7.544	114.079313
14.	dl-Cystathionine	7.905	222.067428
15.	Ethanol , 2-(diethylamino)-,N-oxide	8.620	133.110279
16.	2,4-Heptadien-6-yn-1-ol , (E,E)-	9.015	108.0575147
17.	Xanthine , 1,3-dipropyl-8-[4-[β-[(benzyloxycarbonyla	9.456	619.275448
18.	Isoquinoline ,1-ethyl-	10.674	157.089149
19.	N-Benzyloxycarbonyl-dl-norleucine	10.280	265.131409
20.	2-Acetyl-5-chloromethyl-isoxazolidin-3-one	10.405	177.019271
21.	2,5-Dimethyl-3-n-pentylpyrazine	11.069	178.146998
22.	2,5-Piperazinedione , 3-methyl-6-(1-methylethyl)-	11.544	170.105528
23.	2,6-Dimethyl-3-sec-butylpyrazine	11.859	164.131349
24.	3-Methyl-1,4-diazabicyclo[4.3.0]nonan-2,5-dione	12.208	210.100442
25.	3-Pyrrolidin-2-yl-propionic acid	12.511	143.094628
26.	Cyclohexanecarboxylic acid , 2-phenylethyl ester	12.683	232.14633
27.	Tyramine , N-formyl-	13.930	165.078979

Table 2. Antifungal activity of *Enterobacter aerogenes* metabolite products.

Fungi	**Antibiotics /** *Enterobacter aerogenes* **metabolite products**			
	Enterobacter aerogenes **metabolite products**	**Amphotericin B**	**Fluconazol**	**Miconazole nitrate**
Candida albicans	5.717±0.18	3.829±0.12	2.891.±0.11	2.077±0.12
S. cerevisiae	4.002±0.17	2.071±0.11	1.887±0.10	2.896±0.13
Fusarium sp.	4.981±0.17	1.973±0.10	3.000±0.13	2.719±0.11
Mucor sp.	4.741±0.18	1.995±0.12	1.782±0.11	1.007±0.10
Penicillium expansum	4.003±0.15	3.026±0.13	3.004±0.12	2.135±0.12
Trichoderma viride	5.248±0.18	2.005±0.10	2.015±0.11	3.483±0.13
Trichoderma horzianum	3.852±0.13	1.094±0.11	2.001±0.10	3.091±0.13

[a] The values (average of triplicate) are diameter of zone of inhibition at 100 mg/mL crude extract and 30 µg/mL of (Amphotericin B; Fluconazol and Miconazole nitrate).

Table 3. Zone of inhibition (mm) of test different bioactive compounds and standard antibiotics of medicinal plants to *Enterobacter aerogenes*.

Plant	Inhibition (mm)	Plant	Inhibition (mm)
Rosmarinus oficinalis	5.77±0.20	Citrus sinensis	6.02±0.21
Citrullus colocynthis	4.06±0.18	Ruta graveolens	4.00±0.18
Althaea rosea	5.00±0.19	Thymus vulgaris	5.67±0.20
Coriandrum sativum	6.75±0.22	Passiflora caerulea	5.982±0.18
Origanum vulgare	5.83±0.19	Glycine max	5.66±0.19
Urtica dioica	3.95±0.17	Brassica oleracea	4.14±0.18
Foeniculum vulgare	2.96±0.15	Olea europaea	2.73±0.13
Ocimum basilicum	5.03±0.18	Calendula officinalis	5.00±0.19
Achillea millefolia	5.22±0.17	Taraxacum officinale	3.22±0.16
Medicago sativa	2.84±0.16	Borago officinalis	3.58±0.16
Celosia argentea	3.25±0.16	Sambucus nigra	2.92±0.14
Apium graveolens	4.93±0.18	C. morifolium	6.00±0.20
Brassica rapa	5.98±0.20	*Equisetum arvense*	5.71±0.19
Cichorium endivia	5.68±0.21	*Portulaca oleracea*	5.86±0.20
Malva sylvestris	6.55±0.21	Control	0.00

CONCLUSION

Twenty seven bioactive chemical constituents have been identified from methanolic extract of the *Enterobacter aerogenes*. *Coriandrum sativum* was very highly active. The results of anti-fungal activity produced by *Enterobacter aerogenes* showed that the volatile compounds were highly effective to suppress the growth of *Candida albicans*.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: These experiments were carried out in accordance with approved guidelines and all protocols were approved under the Department of Biology, College of Science, Hillah city, Iraq.

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Analysis of Secondary Metabolites Released by *Pseudomonas fluorescens* Using GC-MS Technique and Determination of Its Anti-Fungal Activity

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ABSTRACT

Pseudomonas fluorescens is a common gram-negative, rod-shaped bacterium [1]. It belongs to the Pseudomonas genus. The objectives of this study were analysis of the secondary metabolite products and evaluation antimicrobial activity. Twenty four bioactive compounds were identified in the methanolic extract of *Pseudomonas fluorescens*. GC-MS analysis of *Pseudomonas fluorescens* revealed the existence of the cis-5,8,11,14,17-Eicosapentaenoic acid, 12,15-Octadecadiynoic acid, methyl ester, 7-epi-cis-sesquisabinene hydrate, α-D-Glucopyranoside , O-α-D-glucopyranosyl, Acetamide, N-methyl-N-[4-[2-acetoxymethyl-1- pyrrol, Acetamide, N-methyl-N-[4-[2-fluoromethyl-1- pyrrolid, Phen-1,4-diol , 2,3-dimethyl-5-trifluoromethyl, Geranyl isovalerate, Quinazoline, 4-methyl, Pentetic acid, trans-13-Octadecenoic acid, 9-Hexadecenoic acid, 13-Hexyloxacyclotridecan -2-one, 7-Methyl-Z-tetradecen-1- ol acetate, cis-13-Eicosenoic acid, Didemin B, Hexadecanoic acid ,1-(hydroxymethyl) -1,2-ethaned, and Ethyl iso –allocholate. *Cassia angustifolia* (Crude) was very highly active (6.007±0.20) mm against *Pseudomonas fluorescens*. The results of anti-fungal activity produced by *Pseudomonas fluorescens* showed that the volatile compounds were highly effective to suppress the growth of *Trichoderma horzianum* (5.019±0.18). *Pseudomonas fluorescens* produce many important secondary metabolites with high biological activities.

Keywords: *Anti-Microbial, Pseudomonas fluorescens, GC-MS, Secondary metabolites.*

INTRODUCTION

P. fluorescens has multiple flagella. It has an extremely versatile metabolism, and can be found in the soil and in water. It is an obligate aerobe, but certain strains are capable of using nitrate instead of oxygen as a final electron acceptor during cellular respiration. *P. fluorescens* is an unusual cause of disease in humans, and usually affects patients with compromised immune systems (e.g., patients on cancer treatment) [1-6]. *P. fluorescens* isolates produce the secondary metabolite 2,4-diacetylphloroglucinol (2,4-DAPG), the compound found to be responsible for antiphytopathogenic and biocontrol properties in these strains. Several strains of P. fluorescens, such as Pf-5 and JL3985, have developed a natural resistance to ampicillin and streptomycin. These antibiotics are regularly used in biological research as a selective pressure tool to promote plasmid expression[7-11]. The aims of our research were analysis of the secondary metabolite products of *Pseudomonas fluorescens* and evaluation antimicrobial activity.

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MATERIALS AND METHOD

Detection of secondary metabolites

Subcultures were obtained on the nutrient agar for 48 hrs. at 22Cº. Metabolites was separated from the liquid culture and evaporated to dryness with a rotary evaporator

at 45Cº. The residue was dissolved in 1 ml methanol, filtered through a 0.2 µm syringe filter, and stored at 4Cº for 24 h before being used for gas chromatography mass spectrometry [12-23]. The identification of the components was based on comparison of their mass spectra with those of NIST mass spectral library as well as on comparison of their retention indices either with those of authentic compounds or with literature values[24-35].

Spectral analysis of bioactive natural chemical compounds of *Pseudomonas fluorescens* using (GC/MS)

Analysis was conducted using GC-MS (Agilent 789 A) equipped with a DB-5MS column (30 m×0.25 mm i.d., 0.25 um film thickness, J&W Scientific, Folsom, CA). The oven temperature was programmed as for the previous analysis[36-39]. Helium was used as the carrier gas at the rate of 1.0 mL/min. Effluent of the GC column was introduced directly into the source of the MS via a transfer line (250 Cº) [40-42].

Determination of antibacterial and antifungal activity

Five-millimeter diameter wells were cut from the agar using a sterile cork-borer, and 25 µl of the plant samples solutions were delivered into the wells. The plates were incubated for 48 h at room temperature. Antimicrobial activity was evaluated by measuring the zone of inhibition against the test microorganisms[43-47]. The studied fungi, *Microsporum canis*, *Aspergillus flavus*, *Candida albicans*, *S. cerevisiae*, *Trichoderma viride*, *Trichoderma horzianum*, and *Aspergillus terreus* were isolated and maintained in potato dextrose agar slants. Spores were grown in a liquid culture of potato dextrose broth (PDB) and incubated at 25ºC in a shaker for 16 days at 130 rpm. The extraction was performed by adding 25 ml methanol to 100 ml liquid culture in an Erlenmeyer flask after the infiltration of the culture. Methanol was used as solvent control. Amphotericin B and fluconazole were used as reference antifungal agent [48-50]. Results of the study were based on analysis of variance (ANOVA) using Statistica Software. A significance level of 0.05 was used for all statistical tests.

RESULTS AND DISCUSSION

Gas chromatography and mass spectroscopy analysis of compounds was carried out in methanolic extract of *Pseudomonas fluorescens*, shown in **Table 1.** GC-MS analysis of *Pseudomonas fluorescens* revealed the existence of the cis-5,8,11,14,17-Eicosapentaenoic acid, 12,15-Octadecadiynoic acid , methyl ester, 7-epi-cis-sesquisabinene hydrate, α-D-Glucopyranoside , O-α-D-glucopyranosyl, Acetamide , N-methyl-N-[4-[2-acetoxymethyl-1- pyrrol, Acetamide , N-methyl-N-[4-[2-fluoromethyl-1- pyrrolid, Phen-1,4-diol , 2,3-dimethyl-5-trifluoromethyl, Geranyl isovalerate, Quinazoline , 4-methyl, Pentetic acid, trans-13-Octadecenoic acid, 9-Hexadecenoic acid, 13-Hexyloxacyclotridecan -2-one, 7-Methyl-Z-tetradecen-1- ol acetate, cis-13-Eicosenoic acid, Didemin B, Hexadecanoic acid ,1-(hydroxymethyl) -1,2-ethaned, and Ethyl iso – allocholate. The results of anti-fungal activity produced by *Pseudomonas fluorescens* showed that the volatile compounds were highly effective to suppress the growth of *Trichoderma horzianum* (5.019±0.18) **Table 2**. *Pseudomonas fluorescens* produce many important secondary metabolites with high biological activities. Based on the significance of employing bioactive compounds in pharmacy to produce drugs for the treatment of many diseases, the purification of compounds produced by *Pseudomonas fluorescens* can be useful. In agar well diffusion method the selected medicinal plants *Nerium olender* (Alkaloids), *Ricinus communis* (Alkaloids), *Datura stramonium*(Alkaloids), *Linum usitatissimum* (Crude), *Anastatica hierochuntica* (Crude), *Cassia angustifolia* (Crude), *Althaea rosea* (Crude), *Coriandrum sativum* (Crude), *Origanum vulgare* (Crude), *Urtica dioica* (Crude), *Foeniculum vulgare* (Crude), and *Ocimum basilicum* (Crude) were effective against *Staphylococcus aureus*, **Table 3**. *Cassia angustifolia* (Crude) was very highly active (6.007±0.20) mm against *Pseudomonas fluorescens*. *Pseudomonas fluorescens* was found to be sensitive to all test medicinal plants and mostly comparable to the standard reference antifungal drug Amphotericin B and fluconazole to some extent.

Table 1. Major chemical compounds identified in methanolic extract of *Pseudomonas fluorescens*.

Serial No.	Phytochemical compound	RT (min)	Molecular Weight
1.	cis-5,8,11,14,17-Eicosapentaenoic acid	3.184	302.22458
2.	12,15-Octadecadiynoic acid , methyl ester	3.293	290.22458
3.	7-epi-cis-sesquisabinene hydrate	3.659	222.198365
4.	α-D-Glucopyranoside , O-α-D-glucopyranosyl	4.283	504.169035
5.	Acetamide , N-methyl-N-[4-[2-acetoxymethyl-1- pyrrol	4.609	266.163042
6.	Acetamide , N-methyl-N-[4-[2-fluoromethyl-1- pyrrolid	4.672	226.148142
7.	Phen-1,4-diol , 2,3-dimethyl-5-trifluoromethyl-	5.295	206.055464
8.	Geranyl isovalerate	6.016	238.19328
9.	Quinazoline , 4-methyl-	7.899	144.068748
10.	Pentetic acid	8.322	393.138344
11.	trans-13-Octadecenoic acid	8.551	282.25588
12.	9-Hexadecenoic acid	10.748	254.22458
13.	13-Hexyloxacyclotridecan -2-one	12.225	282.25588
14.	7-Methyl-Z-tetradecen-1- ol acetate	13.318	268.24023
15.	cis-13-Eicosenoic acid	13.375	310.28718
16.	1,9-Dioxacyclohexadeca - 4,13-diene-2-10-dione , 7	13.678	308.19876
17.	Z-5-Methyl-6-heneicosen-11-one	13.701	322.323566
18.	Didemin B	14.525	1111.64166
19.	Hexadecanoic acid ,1-(hydroxymethyl) -1,2-ethaned	14.719	568.506676
20.	Pregn-4-ene-3,20-dione , 17,21-dihydroxy-, bis(O-me	18.130	404.267508
21.	Androst -5,7-dien-3-ol-17-one	18.679	286.19328
22.	(22S)-21-Acetoxy-6α , 11β-dihydroxy-16α 17α-propy	19.743	488.241018
23.	Ethyl iso -allocholate	21.843	436.318874
24.	4H-Cyclopropa[5',6']bens[1',2':7,8]azuleno[5,6-b]ox	22.759	422.194067

Table 2. Antifungal activity of *Pseudomonas fluorescens* metabolite products.

Microorganism	***Pseudomonas fluorescens* products**	Fluconazol
Microsporum canis	3.116±0.16 [a]	3.110±0.15
Aspergillus flavus	5.000±0.19	4.309±0.17
Candida albicans	4.702±0.17	2.873.±0.12
S. cerevisiae	3.005±0.16	2.000±0.11
Trichoderma viride	4.957±0.17	1.704±0.10
Trichoderma horzianum	5.019±0.18	4.005±0.19
Aspergillus terreus	4.951±0.16	3.251±0.17

[a] The values (average of triplicate) are diameter of zone of inhibition at 100 mg/mL crude extract and 30 µg/mL of (Amphotericin B; Fluconazol and Miconazole nitrate).

Table 3. Zone of inhibition (mm) of test different bioactive compounds and standard antibiotics of medicinal plants to *Pseudomonas fluorescens*.

S. No.	Plant	Zone of inhibition (mm)
1.	*Nerium olender* (Alkaloids)	3.779±0.17
2.	*Ricinus communis* (Alkaloids)	2.639±0.15
3.	*Datura stramonium*(Alkaloids)	3.990±0.16
4.	*Linum usitatissimum* (Crude)	4.815±0.18
5.	*Anastatica hierochuntica* (Crude)	5.941±0.19
6.	*Cassia angustifolia* (Crude)	6.007±0.20
7.	*Althaea rosea* (Crude)	5.000±0.18
8.	*Coriandrum sativum* (Crude)	5.943±0.19
9.	*Origanum vulgare* (Crude)	5.799±0.18
10.	*Urtica dioica* (Crude)	4.228±0.16
11.	*Foeniculum vulgare* (Crude)	3.000±0.14
12.	*Ocimum basilicum* (Crude)	5.716±0.17
13.	Control	0.00

CONCLUSION

Twenty four bioactive chemical constituents have been identified from methanolic extract of the *Pseudomonas fluorescens* by GC-MS. In vitro antifungal and antibacterial evaluation of secondary metabolite products of *Pseudomonas fluorescens* forms a primary platform for further phytochemical and pharmacological investigation for the development of new potential antimicrobial compounds.

Financial disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Biology, College of Science, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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Characterization of Metabolites Produced by *Shegilla dysenteriae* and Determination of Its Anti-Fungal Activity

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ABSTRACT

Shigella species generally invade the epithelial lining of the colon, causing severe inflammation and death of the cells lining the colon. This inflammation results in the diarrhea and even dysentery that are the hallmarks of Shigella infection. The aims of our research were analysis of the secondary metabolite products and evaluation antifungal activity. Forty bioactive compounds were identified in the methanolic extract of *Shegilla dysenteriae*. GC-MS analysis of *Shegilla dysenteriae* revealed the existence of the 1-Deoxy-d-mannitol, γ-Thionodecalactone, Hexaborane, 1-Propanamine, 3-(methylthio), 1H-Pyrrole, 1-pentyl, 2-Propanone, 1-(N-cyanomethylimino-), 1-Pentanol, 5-methoxy, 2-Methyl-4-methoxy-1-butanol, Benzeneethanamine, 2-Butanamine , (S), L-valine , N-glycyl, N-carbobenzyloxy-l-tyrosyl-l-valine, DL-Isoleucine, and 3-Buten-2-one, 4-(dimethylamino)-3-[(1-methylethyl). *Daucus carota* was very highly active (6.953±0.22) mm. The results of anti-fungal activity produced by *Shegilla dysenteriae* showed that the volatile compounds were highly effective to suppress the growth of *Aspergillus flavus* (6.00±0.22). Based on the significance of employing bioactive compounds in pharmacy to produce drugs for the treatment of many diseases, the purification of compounds produced by *Shegilla dysenteriae* can be useful.

Keywords: *Shegilla dysenteriae, GC-MS, Anti-microbial, Secondary metabolites.*

INTRODUCTION

Shigella infection is typically by ingestion. Depending on the health of the host, fewer than 100 bacterial cells can be enough to cause an infection. Some strains of Shigella produce toxins which contribute to disease during infection. Shigella species invade the host through the M-cells interspersed in the gut epithelia of the small intestine, as they do not interact with the apical surface of epithelial cells, preferring basolateral side[1-5]. After invasion, Shigella cells multiply intracellularly and spread to neighboring epithelial cells, resulting in tissue destruction and characteristic pathology of shigellosis. Shigella uses a type-III secretion system, which acts as a biological syringe to translocate toxic effector proteins to the target human cell. The effector proteins can alter the metabolism of the target cell, for instance leading to the lysis of vacuolar membranes or reorganization of actin polymerization to facilitate intracellular motility of Shigella bacteria inside the host cell [6-9]. The most common symptoms are diarrhea, fever, nausea, vomiting, stomach cramps, and flatulence. It is also commonly known to cause large and painful bowel movements. Virulent Shigella strains produce disease after invading the intestinal mucosa; the organism only rarely penetrates beyond the mucosa. The stool may contain blood, mucus, or pus. Hence, Shigella cells may cause dysentery. Shigella is implicated as one of the pathogenic causes of reactive arthritis worldwide.

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MATERIALS AND METHOD

Detection of secondary metabolites

Shegilla dysenteriae metabolites were separated from the liquid culture and evaporated to dryness with a rotary evaporator at 45Cº. The residue was dissolved in 1 ml methanol, filtered through a 0.2 µm syringe filter, and stored at 4ºC for 24 h before being used for gas chromatography mass spectrometry[10-22]. The identification of the components was based on comparison of their mass spectra with those of NIST mass spectral library as well as on comparison of their retention indices either with those of authentic compounds or with literature values[23-35].

Materials of Plants Collection and Preparation

In our research, all plant samples were dried at room temperature for fifteen days and when properly dried the leaves were powdered using clean pestle and mortar, and the powdered plant was size reduced with a sieve[36-39]. The fine powder was then packed in airtight container to avoid the effect of humidity and then stored at room temperature.

Gas chromatography – Mass Spectrum analysis

Interpretation of mass spectrum was conducted using the database of National Institute of Standards and Technology (NIST, USA). The database consists of more than 62,000 patterns of known compounds. The spectrum of the extract was matched with the spectrum of the known components stored in the NIST library. *Shegilla dysenteriae* GC–MS analysis were carried out in a GC system (Agilent 7890A series, USA) [40-42]. The flow rate of the carrier gas, helium (He) was set to beat 1 mL min−1, split ratio was 1:50. The injector temperature was adjusted at 250◦C, while the detector temperature was fixed to280◦C.

Determination of antibacterial and antifungal activity

Five-millimeter diameter wells were cut from the agar using a sterile cork-borer, and 25 µl of the plant samples solutions were delivered into the wells. The plates were incubated for 48 h at room temperature. Antimicrobial activity was evaluated by measuring the zone of inhibition against the test microorganisms. The studied fungi, *Microsporum canis*, *Streptococcus faecalis*, *Aspergillus flavus*, *Aspergillus fumigatus, Candida albicans*, *Penicillium expansum*, *Trichoderma horzianum*, *Aspergillus niger* and *Aspergillus terreus* were isolated and maintained in potato dextrose agar slants. Spores were grown in a liquid culture of potato dextrose broth (PDB) and incubated at 25ºC in a shaker for 16 days at 130 rpm. The extraction was performed by adding 25 ml methanol to 100 ml liquid culture in an Erlenmeyer flask after the infiltration of the culture [43-45]. The antifungal activity was evaluated by measuring the inhibition-zone diameter observed after 48 h of incubation.

Data analysis

All the measurements were replicated three times for each assay and the results are presented as mean ± SD and mean ± SE. IBM SPSS 20 version statistical software package was used for statistical analysis of percentage inhibition and disease incidence and disease severity in each case.

RESULTS AND DISCUSSION

Gas chromatography and mass spectroscopy analysis of compounds was carried out in methanolic extract of *Shegilla dysenteriae*, shown in **Table 1.** Peaks were determined to be 1-Deoxy-d-mannitol, γ-Thionodecalactone, Hexaborane, 1-Propanamine , 3-(methylthio), 1H-Pyrrole , 1-pentyl, 2-Propanone, 1-(N-cyanomethylimino-), 1-Pentanol , 5-methoxy, 2-Methyl-4-methoxy-1-butanol, Benzeneethanamine, 2-Butanamine , (S), L-valine , N-glycyl, N-carbobenzyloxy-l-tyrosyl-l-valine, DL-Isoleucine, and 3-Buten-2-one , 4-(dimethylamino)-3-[(1-methylethyl). The results of anti-fungal activity produced by *Shegilla dysenteriae* showed that the volatile compounds were highly effective to suppress the growth of *Aspergillus flavus* (6.00±0.22) mm, **Table 2**. *Shegilla dysenteriae* produce many important secondary metabolites with high biological activities. In agar well diffusion method the selected medicinal plants *Ricinus communis*, *Datura stramonium*, *Linum usitatissimum*, *Diplotaxis cespitosa*, *Cassia angustifolia, Celosia argentea, Apium graveolens, Brassica rapa, Cichorium endivia, Anethum graveolens, Plantago major, Linum usitatissimum, A. esculentus, Malva sylvestris, Cordia myxa, Malva parviflora, Mentha pulegium, Daucus carota, Vitex agnus-castus, Sambucus nigra, C. morifolium, Equisetum arvense, Portulaca oleracea, Malva neglecta, L. angustifolia, Althaea Officinalis,* and

Melissa officinalis were effective against *Staphylococcus aureus*, **Table 3**. *Aspergillus flavus* was very highly active (6.00±0.22) mm against *Pseudomonas aeruginosa*.

Table 1. Major chemical compounds identified in methanolic extract of *Shegilla dysenteriae*.

Serial No.	Phytochemical compound	RT (min)	Molecular Weight
1.	Alpha-l-rhamnopyranose	3.110	164.068474
2.	1-Deoxy-d-mannitol	3.161	166.084124
3.	γ-Thionodecalactone	14.949	186.107836
4.	Hexaborane	3.482	76.134083
5.	1-Propanamine , 3-(methylthio)-	3.848	105.06122
6.	1H-Pyrrole , 1-pentyl-	3.945	137.120449
7.	2-Propanone, 1-(N-cyanomethylimino-)	4.088	110.0480127
8.	1,5-Pentanediamine	4.237	102.1156983
9.	1-Pentanol , 5-methoxy-	4.432	118.0993795
10.	2-Methyl-4-methoxy-1-butanol	4.592	118.0993795
11.	2H-Pyran , tetrahydro-2-(2,5-undecadiynyloxy)-	4.746	248.17763
12.	Benzeneethanamine	4.941	121.0891495
13.	8-Azabicyclo[5.1.0]octane	5.147	111.1047993
14.	Benzenemethanol , 2-(2-aminopropoxy)-3-methyl-	5.233	195.125929
15.	2,5-Dimethyl-1-pyrroline	5.502	97.0891495
16.	Cycloheptanol , 2-chloro-,trans-	6.057	148.065493
17.	Phenylhydrazine , 4-nitro-N2-(chloro)(2-thienyl)meth)	6.331	281.002575
18.	2-Butanamine , (S)-	6.692	73.0891495
19.	L-valine , N-glycyl-	6.955	174.100442
20.	5H-1-Pyrindine	7.161	117.0578494
21.	Ornithine	7.487	132.089878
22.	DL-Valine	8.277	117.0789785
23.	2,7-Dioxa-tricyclo[4.4.0.0(3,8)]deca-4,9-diene	9.049	136.052429
24.	Benzenemethanol , α-(2-nitrocyclopentyl)	9.198	221.105193
25.	N-carbobenzyloxy-l-tyrosyl-l-valine	9.747	414.179087
26.	N-Carbobenzyloxy-glycylglutamine	9.890	338.1114
27.	Di-[1,3,2]-oxazino[6,5-f:5',6'-H]quinoxaline	9.988	594.368225
28.	DL-Isoleucine	11.046	131.094628
29.	Uric acid	12.168	168.02834
30.	Pyrrolo[1,2-a]pyrazine-1,4-dione , hexahydro-	12.826	154.074227
31.	Pyrrolo[1,2-a]pyrazine-1,4-dione , hexahydro-3-(2-me	13.592	154.074227
32.	: 2-Undecene , (Z)	14.308	154.172151
33.	Dihexylamine , N-nitro-	15.046	230.199429
34.	Uracil , 1,3-dimethyl-6-hydrazino-	15.704	170.080376
35.	3-Buten-2-one , 4-(dimethylamino)-3-[(1-methylethyl)	15.732	170.141913
36.	Oxacyclododecan-2-one	16.362	184.14633
37.	8H-[1,2,5]Thiadiazolo[3,4-e][1,4]diazepin-8-one , 4	16.556	170.026232
38.	2,5-Piperazinedione , 3,6-bis(2-methylpropyl)-	16.774	226.168128
39.	Methyl 2-diethylamino-3-methyl-but-2-enoate	19.709	185.141579
40.	L-Prolinamide , 5-oxo-L-prolyl-L-phenylalanyl-4-hydro	20.173	388.17467

Table 2. Antifungal activity of *Shegilla dysenteriae* metabolite products.

Fungi	Antibiotics / *Shegilla dysenteriae* metabolite products			
	Shegilla dysenteriae metabolite products	Amphotericin B	Fluconazol	Miconazole nitrate
Microsporum canis	2.80±0.18 [a]	2.11±0.11	3.06±0.17	2.97±0.17
Streptococcus faecalis	3.01±0.19	3.03±0.16	2.88±0.15	1.81±0.10
Aspergillus flavus	6.00±0.22	2.75±0.12	3.97±0.19	3.06±0.18
Aspergillus fumigatus	5.91±0.21	2.38±0.11	2.76±0.16	2.04±0.16
Candida albicans	5.53±0.19	3.55±0.19	2.85.±0.13	1.85±0.10
Penicillium expansum	4.00±0.17	3.10±0.18	3.02±0.18	1.99±0.10
Trichoderma horzianum	3.87±0.19	1.09±0.09	3.84±0.19	2.98±0.17
Aspergillus niger	5.00±0.19	2.00±0.10	2.95±0.17	2.03±0.15
Aspergillus terreus	4.83±0.18	2.83±0.11	3.07±0.19	3.00±0.18

[a] The values (average of triplicate) are diameter of zone of inhibition at 100 mg/mL crude extract and 30 µg/mL of (Amphotericin B; Fluconazol and Miconazole nitrate).

Table 3. Zone of inhibition (mm) of test different bioactive compounds and standard antibiotics of medicinal plants to *Shegilla dysenteriae*.

Plant	Inhibition (mm)	Plant	Inhibition (mm)
Ricinus communis	2.951±0.17	Cordia myxa	2.881±0.16
Datura stramonium	3.617±0.19	Malva parviflora	3.704±0.19
Linum usitatissimum	4.991±0.20	Mentha pulegium	6.100±0.21
Diplotaxis cespitosa	5.984±0.21	Daucus carota	6.953±0.22
Cassia angustifolia	5.977±0.21	Vitex agnus-castus	5.800±0.20
Celosia argentea	3.271±0.18	Sambucus nigra	2.952±0.16
Apium graveolens	4.880±0.20	C. morifolium	5.996±0.20
Brassica rapa	6.274±0.22	*Equisetum arvense*	5.851±0.21
Cichorium endivia	5.628±0.21	*Portulaca oleracea*	6.000±0.22
Anethum graveolens	5.749±0.20	*Malva neglecta*	5.572±0.19
Plantago major	4.951±0.19	*L. angustifolia*	2.871±0.16
Linum usitatissimum	4.000±0.18	*Althaea Officinalis*	6.002±0.20
A. esculentus	5.981±0.21	*Melissa officinalis*	6.704±0.22
Malva sylvestris	6.400±0.22	Control	0.00

CONCLUSION

Forty bioactive chemical constituents have been identified from methanolic extract of the *Pseudomonas aeruginosa* by gas chromatogram mass spectrometry (GC-MS). In vitro antifungal and antibacterial evaluation of secondary metabolite products of *Pseudomonas aeruginosa* forms a primary platform for further phytochemical and pharmacological investigation for the development of new potential antimicrobial compounds.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols

were approved under the Department of Biology, College of Science, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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Different Oral and Orolabial Appearances in Groups of Children with Down Syndrome in Babylon City-Iraq

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ABSTRACT

Down syndrome (DS) is one of the important genetic or chromosomal defects involving different organs; one of these organs is orofacial apparatus. The aim of the study was to determine the incidence of lip and oral soft lesions among groups of children with DS in Babylon- city in Iraq. Fifty (50) children with DS, and these subjects were matched with same ages, genders with others healthy schoolchildren as controls. This study was applied from January to July 2017 in Babylon centers for disabled children / Babylon-Iraq, between the ages 4-17 years old. Three types of orofacial lesions were appeared in the DS, most of them were fissured tongue 43 (78.1%), lip fissures 35 (63.6%), and angular cheilitis 21 (38.1%), and these results compared with healthy controls. The presence of the above orofacial lesions in healthy controls were: fissured tongue 16 (25.4%), lip fissures 0 (0%), and angular cheilitis 1 (1.8%). The majority of DS children were associated with fissured tongue (in the midline), and the presence of lip fissures in both upper and lower lips. There was correlation between the presence of different types of lip lesions, fissures and angular cheilitis (p- value= 0.001). To the best of our knowledge this is the first study in Iraq that deals with oral and orolabial lesions in DS subjects. The orolabial lesions among DS subjects are remarkably high. Oral medicine or oral physician specialists should be aware of the orolabial features seen more frequently in this chromosomal abnormality.

Keywords: *Orolabial, Down's syndrome, features.*

INTRODUCTION

Down syndrome (DS) is most obvious and popular chromosomal irregularity affecting multiple organs, referred as trisomy 21[1]. This congenital anomaly is characterized by defect in immune response and function is common for pathognomonic for this syndrome will result in different types of viral and fungal infections, error in cell division, physical abnormalities[2]. Also the Down syndrome (DS) is occurs with short stature, cardiovascular problems, malignant as leukemia, autoimmune, abnormalities in musculoskeletal, neurological issues, general hypotonia, behavioral approach, respiratory infections as well as anomalies in dental status and intraoral features [3,4]. Down syndrome (DS), is characterized by multiple oral and perioral features as protruding with enlarged tongue, mouth breathing with anterior open bite, different stages of mouth drooling, lip and tongue fissuring, malocclusion with incidence of dental caries due to improper maintain oral hygiene[5-7]. Tongue fissuring is the most obvious oral soft tissues features in DS. It's appears that fissured tongue is more frequent in individuals with DS than the other general population, and its appearances rises with increasing or progressing of age[8]. The incidence of angular cheilitis also appears highly occur in individuals with Down syndrome [9], and has been attributed to depressing in the nasal bridge and muscular hypotonia which leading to a mouth opening and protruding tongue. Lip fissures, sometimes named lips fissuring or cracking, are also commonly seen in DS individuals, compared with other patients with disability in learning ability as well as compared with the other general population[10]. The most common craniofacial

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features observed in children with DS are: small nose, low nasal bridge, narrow, short, deep and high palate, bifid uvula, underdeveloped jaw, cleft lip, incomplete lip closure, hypotonic lips, fissured tongue, inaccurate and slow tongue movement and changes in temporary and permanent tooth eruption [11,12]. The tongue gives the impression of being abnormally large architecture and on account of muscle weakness and of an anterior and low position in the mouth (relative macroglossia) [12]. As DS patients are mouth breathers, exhibit open bite and their orofacial muscles are hypotonic, there's an incomplete closure of the lips [13]. It causes an imbalance in orofacial development which leads to malocclusion and craniofacial malformations such as the hypoplasia of the midface [14]. Because of presence of a protruding of the tongue and a muscular hypotonicity, these children have oral-motor troubles (seen in swallowing, chewing and sucking) [15]. Hypotonicity is associated with laxity in the ligament; easily visible throughout the body. These induce highlyflexiblelity in the joints, which can involve the periodontal ligament, also induces hyperflexible joints, which can compromise the periodontal ligaments [16]. Salivary excess on the labial commissure is also correlated to the muscle hypotonicity and can lead to irritation, cracking (angular cheilitis), aphthous ulcers and infectious conditions like candidiasis [17, 18].

MATERIALS AND METHOD

This study was applied from January to July 2017 in Babylon centers for disabled children / Babylon- Iraq, between the ages 4-17 years old, included 50 children with DS, and these subjects were matched with same ages, genders with others healthy schoolchildren as controls. All the children had been examined and diagnosed previously according to medical records institution for persons with special needs. All those children with DS with inclusion criteria were: (1) 21 trisomy as a cytogenetic diagnosis, (2) enough cooperation from DS children, and (3) consent was taken from the DS children's parents. The exclusion criteria as the other detrimental systemic complications, complex disability, and uncooperative children. And the healthy children were selected randomly from one neighborhood school. The informed consent was obtained from the parents and the school teachers before this study was induced. Intra and extra- oral examination was induced by oral medicine specialist (lecturer: Ali Mihsen Hussein Al yassiri, MSc. Oral medicine, with standard registration form. Oral examinations were evaluated by using mouth mirror, gauze and wooden tongue depressor to exploration of oral lesions. The diagnosis of fissures lip and angular chelitis according to Scully et al., (2002) [10]. SPSS version 20.0 was used for data entry and analysis.

RESULTS AND DISCUSSION

The mean age of the DS children was 10.5 years (range from 4 to 17), these subjects associated with oral lesions. Three types of orofacial lesions were appeared in the DS, most of them were fissured tongue 43 (78.1%), lip fissures 35 (63.6%), and angular cheilitis 21 (38.1%), and these results compared with healthy controls. The presence of the above orofacial lesions in healthy controls were: fissured tongue 16 (25.4%), lip fissures 0 (0%), and angular cheilitis 1 (1.8%). The majority of DS children were associated with fissured tongue (in the midline), and the presence of lip fissures in both upper and lower lips. There was correlation between the presence of different types of lip lesions, fissures and angular cheilitis (p- value= 0.001) Figure 1. The development of disease in the population is consider as database for public health information and knowledge , to investigate the occurrence of lips, tongue fissuring and angular cheilitis in down syndrome, for this reason this research was carried out. To the best of our knowledge this is the first study in Iraq that deals with oral and orolabial lesions in DS subjects. The fissured tongue, lips fissuring and angular cheilitis are most common features were appeared in theses populations; fissured tongue and lips fissures were significantly higher in DS subjects when compared with healthy controls, these results were matched with Daneshpazhooh et al., (2007) [19] , Bilgili et al., (2011) [8], Asokan et al., (2008) [9]. The percentage of incidence of fissured tongue in these subjects was (78.1%), and agreed with other previous studies Bannkin and Guenther, et al., (2001) [20], Asokan et al., (2008) [9], suggesting the tongue fissuring in DS subjects that increased in parallel status by the patient age; this idea was agreed with Ercis et al., (1996) [21] Lips fissuring (63.6%) was another most prevalent oral phenomena in DS populations and significantly higher when make a comparison with healthy controls (0.0%), this is also reported by Scully et al., (2002) [10]. In our study and also in previous studies, the midline of lower lip was the main place for lips fissuring, this etiology of fissuring lips is still unknown. As a general explanation; the congenital decrease in both size and numbers of mucous glands in lips will lead to lips fissures, but this ideas still hypothesis not well documented in DS

subjects[22]. Lip fissuring in general populations also occurred due to mouth breathing, avitmainosis, smoking and fungal infections[23]. Lip incompetence, a tongue protruded with drooling and frequency rhinitis caused by a narrow air passage; these tongue irregularities are due to mouth breathing, these results were matched with Scully et al., (2002)[10]. Candidial albicans, mandible bone prognathism and lips eversions were related to lips fissuring[24]. Angular chelitis was the third most popular lesion in DS subjects, affecting more than one third of these subjects, with no difference between males and female. The incidence of angular cheilitis was significantly high in these subjects when compared to healthy controls (38.1% vs. 1.8%) [9,10]. Angular chelitis is an acute or in some times chronic inflammation including skin and labial mucous membrane in the mouth angles[25]. Mechanical, immune defects, infective and nutritional factors all these causes will predispose to angular cheilitis. The incidence of angular cheilitis may occur by candida albicans as a result of immune decline and drooling of saliva from mouths of these children [10]. The tendency of orofacial infections, especially with candida species that reported in DS subjects, this idea was matched with Carlstedt et al., (1996) [26].

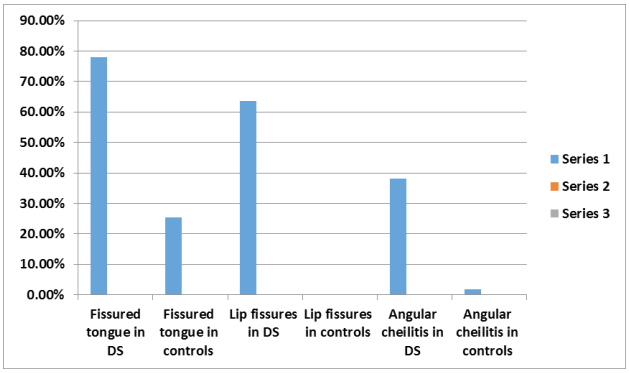

Figure 1. Distribution of orofacial lesions in both DS children and healthy controls.

CONCLUSION

The diversity of orofacial anomalies present in this underprivileged group of population, will lead to dentists and physicians should be aware.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Oral surgery and Oral diagnosis, College of Dentistry, University of Babylon, Hillah city, Iraq, and all experiments were carried out in accordance with approved guidelines.

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Screening of Bioactive Compounds of *Ricinus communis* Using GC-MS and FTIR and Evaluation of its Antibacterial and Antifungal Activity

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ABSTRACT

The objectives of this study were detection of the secondary metabolite products and evaluation antibacterial and antifungal activity. Bioactives are chemical compounds often referred to as secondary metabolites. Sixteen bioactive compounds were identified in the methanolic extract of *Ricinus communis*. The identification of bioactive chemical compounds is based on the peak area, retention time molecular weight and molecular formula. GC-MS analysis of *Ricinus communis* revealed the existence of the1,2,3,4-Butanetetrol, [S-(R*,R*)]-, Ribitol, 3-Ethoxy-1,2-propanediol, DL-Arabinose, p-Dioxane-2,3-diol, D-Limonene, Dodecanoic acid, 3-hydroxy-, Methyl 6-oxoheptanoate, Dithiocarbamate, S-methyl-, N-(2-methyl-3-oxobutyl)-, (5β)Pregnane-3,20β-diol,14α,18α-[4-methyl-3-oxo-(1-oxa-4- , 3-(N,N-Dimethllaurylammonio)propanesulfonate, Cetene, Gibberellic acid, Geranyl isovalerate, Phenol,4-(1,1,3,3-tetramethylbutyl)-, Picrotoxinin, and α-N-Normethadol. The FTIR analysis of *Ricinus communis* leaves proved the presence of alkanes, and alkyl halide, Amine, Aldehyde, and Alkane which shows major peaks at 781.17, 875.68, 923.90, 1018.41, 1240.23, 1319.31, 1361.74, 1361.74, 2357.01, 2850.79 and 2920.23. Clinical pathogens were selected for antibacterial activity namely, *Pseudomonas eurogenosa, Klebsiella pneumonia, Escherichia coli, Staphylococcus aureus,* and *Proteus mirabili*. *Ricinus communis* has maximum zone against *Klebsiella pneumonia (*5.000±0.19)

Keywords: *Ricinus communis, GC-MS, Bioactive, Natural compounds.*

INTRODUCTION

The medicinal use of natural products compounds that are derived from natural sources such as plants, animals or microorganisms precedes recorded human history probably by thousands of years[1]. Ricinus communis, is a species of flowering plant which belongs to the family Euphorbiaceae. Castor is indigenous to the southeastern Mediterranean Basin, Eastern Africa, and India, but is widespread throughout tropical regions (and widely grown elsewhere as an ornamental plant). Herbal products and secondary metabolites formed by plants have shown great potential in treating human diseases such as cancer, coronary heart diseases, diabetes and infectious diseases. Antihistamine and anti-inflammatory properties were found in ethanolic extract of *Ricinus communis* roots[2-5]. This plant is widely available in India to obtain Castor oil which is used as a coolant and also to cure indigestion, this plant was chosen to be screened for antimicrobial properties because of its ready availability and promise as a medicinal plant. Various drug resistant forms of these bacteria have been isolated. Since the treatment of drug resistant pathogens has proved to be a very difficult task, it is important to develop new drugs that act on these resistant varieties. The castor oil has

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many industrial uses [6-10]. It is used in the manufacture of printing ink, linoleum and oilcloth. Owing to their strong bactericidal action, sodium ricionoleate and sulphoricinoleate are important ingredients in toothpaste formulations. Sulphonated castor oil (Turkey oil) is used in cotton dyeing and printing and also in the leather industry. Hydrogenated castor oil is used in the manufacture of ointment bases, waxes, polishes carbon paper and candles. The aims of our research were analysis of the secondary metabolite products and determination of antibacterial and antifungal activity

MATERIALS AND METHOD

Collection and Preparation of Plant Material

In this research, *Ricinus communis* leaves were dried at room temperature for fifteen days and the fine powder was then packed in airtight container [11-19] to avoid the effect of humidity and then stored at room temperature.

Gas Chromatography-Mass Spectroscopy (GC-MS) and Fourier Transform Infrared Spectrophotometer (FTIR) analysis

GC-MS analysis of the ethanol extract of *Ricinus communis* was carried out using a (Agilent 7890A series, USA) [20-31]. The powdered sample of *Ricinus communis* was treated for FTIR spectroscopy (Shimadzu, IR Affinity 1, Japan). The sample was run at infrared region between 400 nm and 4000 nm.

Determination of antimicrobial activity of crude bioactive compounds of *Ricinus communis*

Antimicrobial activity was evaluated by measuring the zone of inhibition against the test microorganisms. Methanol was used as solvent control. Amphotericin B and fluconazole were used as reference antifungal agent [32-38]. The tests were carried out in triplicate.

RESULTS AND DISCUSSION

GC-MS analysis of alkaloid compound clearly showed the presence of sixteen compounds and the components corresponding to the peaks were determined 1,2,3,4-Butanetetrol , [S-(R*,R*)]- , Ribitol , 3-Ethoxy-1,2-propanediol , DL-Arabinose , p-Dioxane-2,3-diol , D-Limonene , Dodecanoic acid ,3-hydroxy- , Methyl 6-oxoheptanoate , Dithiocarbamate , S-methyl-,N-(2-methyl-3-oxobutyl)- , (5β)Pregnane-3,20β-diol,14α,18α-[4-methyl-3-oxo-(1-oxa-4- , 3-(N,N-Dimethllauryl-ammonio) propanesulfonate , Cetene , Gibberellic acid , Geranyl isovalerate , Phenol,4-(1,1,3,3-tetramethylbutyl)- , Picrotoxinin , and α-N-Normethadol **Table 1.** The FTIR analysis of *Ricinus communis* leaves proved the presence of alkanes, and alkyl halide, Amine, Aldehyde, and Alkane which shows major peaks at 781.17, 875.68, 923.90, 1018.41, 1240.23, 1319.31, 1361.74, 1361.74, 2357.01, 2850.79 and 2920.23 **Table 2**. In the current study, the anti-microbial activity of *Ricinus communis* methanolic extract was evaluated by determining the zone of inhibition against five bacteria and fourteen fungi and yeast. Clinical pathogens were selected for antibacterial activity namely, *Pseudomonas eurogenosa, Klebsiella pneumonia, Escherichia coli, Staphylococcus aureus,* and *Proteus mirabili*. *Ricinus communis* has maximum zone against *Klebsiella pneumonia* (5.000±0.19) **Table 3**. Antifungal activities against *Aspergillus niger, Aspergillus terreus*, *Aspergillus flavus*, and *Aspergillus fumigatus Ricinus communis* was very highly active against *Aspergillus flavus* (5.898±0.14) **Table 4**. As an attempt to discover new lead compounds, plant extracts are screened by many researchers to detect secondary metabolites having relevant biological activities, including antimicrobial activities. In comparison to the antibiotics used in this study, the plants extracts were far more active against the test bacterial strains[39-45]. However, further studies are needed, including toxicity evaluation and purification of active antibacterial constituents from *Ricinus communis* extracts looking toward a pharmaceutical use[46-51].

Table 1. Major phytochemical compounds identified in methanolic extract of *Ricinus communis*.

Serial No.	Phytochemical compound	RT (min)	Molecular Weight	Exact Mass
1.	1,2,3,4-Butanetetrol , [S-(R*,R*)]-	3.150	122	122.057909
2.	Ribitol	3.264	152	152.068474
3.	3-Ethoxy-1,2-propanediol	3.316	120	120.0786443

Cont... **Table 1. Major phytochemical compounds identified in methanolic extract of *Ricinus communis*.**

4.	DL-Arabinose	3.362	150	150.052823
5.	p-Dioxane-2,3-diol	3.367	120	120.0422587
6.	D-Limonene	4.374	136	136.1252
7.	Dodecanoic acid ,3-hydroxy-	5.782	216	216.1725445
8.	Methyl 6-oxoheptanoate	5.679	158	158.094295
9.	Dithiocarbamate , S-methyl-,N-(2-methyl-3-oxobutyl)-	5.811	191	191.043856
10.	(5β)Pregnane-3,20β-diol,14α,18α-[4-methyl-3-oxo-(1-oxa-4-	8.557	489	489.309038
11.	3-(N,N-Dimethllaurylammonio) propanesulfonate	8.900	335	335.249414
12.	Cetene	9.776	224	224.2504015
13.	Gibberellic acid	10.646	346	346.141638
14.	Geranyl isovalerate	10.915	238	238.19328
15.	Phenol,4-(1,1,3,3-tetramethylbutyl)-	11.109	206	206.167066
16.	Picrotoxinin	12.786	292	292.094688

Table 2. Fourier-transform infrared spectroscopic profile solid analysis of *Ricinus communis*.

No.	Peak (Wave number cm^{-1})	Type of Intensity	Bond	Type of Vibration	Functional group assignment	Group frequency
1.	781.17	Strong	=C–H	Bending	Alkenes	650-1000
2.	875.68	Strong	=C–H	Bending	Alkenes	650-1000
3.	923.90	Strong	=C–H	Bending	Alkenes	650-1000
4.	1018.41	Strong	C-F	Stretch	alkyl halides	1000-1400
5.	1240.23	Strong	C-F	Stretch	alkyl halides	1000-1400
6.	1319.31	Strong	C-F	Stretch	alkyl halides	1000-1400
7.	1361.74	Strong	C-F	Stretch	alkyl halides	1000-1400
8.	2357.01	Unknown	-	-	-	-
9.	2850.79	Strong	C-H	Stretch	Alkane	2850-3000
10.	2920.23	Strong	C-H	Stretch	Alkane	2850-3000

Table 3. Zone of inhibition (mm) of test bacterial strains to Ricinus communis bioactive compounds and standard antibiotics.

Bacteria	Plant (*Ricinus communis)* / Antibiotics			
	Ricinus communis	Streptomycin	Rifambin	Cefotoxime
Pseudomonas eurogenosa	3.843±0.17	1.082±0.12	0.993±0.11	1.273±0.11
Escherichia coli	3.071±0.16	1.624±0.13	1.006±0.12	1.996±0.13
Klebsiella pneumonia	5.000±0.19	1.881±0.13	1.152±0.12	0.817±0.10
Staphylococcus aureus	3.829±0.17	0.973±0.11	1.937±0.14	0.981±0.11
Proteus mirabilis	2.000±0.14	2.419±0.15	2.005±0.14	1.775±0.12

Table 4. Zone of inhibition (mm) of *Aspergillus Spp.* test to *Ricinus communis* bioactive compounds and standard antibiotics.

/ Plant Antibiotics	*Aspergillus Spp.*			
	Aspergillus niger	*Aspergillus terreus*	*Aspergillus flavus*	*Aspergillus fumigatus*
Plant	3.120±0.12	5.093±0.14	5.898±0.14	4.985±0.13
Amphotericin B	2.775±0.11	4.379±0.13	4.094±0.13	4.073±0.12
Fluconazol	5.001±0.14	3.311±0.11	3.000±0.11	4.850±0.13
Control	0.00	0.00	0.00	0.00

CONCLUSION

Sixteen chemical constituents have been identified from methanolic extract of the *Ricinus communis* by gas chromatogram mass spectrometry (GC-MS). In vitro antibacterial and antifungal determination of *Ricinus communis* forms a primary platform for further phytochemical and pharmacological investigation for the development of new potential antimicrobial compounds.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Biology, College of Science, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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Analysis of Bioactive Chemical Compounds of Methanolic Seed Extract of *Annona cherimola* (Graviolla) Using Gas Chromatography – Mass Spectrum Technique

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ABSTRACT

Natural remedies from medicinal plants are found to be safe and effective. Many plant species have been used in folkloric medicine to treat various ailments. Plants are a rich source of secondary metabolites with interesting biological activities. The objective of this study was analysis of the secondary metabolite products of *Annona cherimola* (Graviolla). Bioactives are chemical compounds often referred to as secondary metabolites. Nineteen bioactive compounds were identified in the methanolic extract of *Graviolla*. The identification of bioactive chemical compounds is based on the peak area, retention time molecular weight and molecular formula. GC-MS analysis of *Graviolla* revealed the existence of the 6-Methoxy-2-phenyl-hexahydropyrano[2,3-b][1,3]dioxine-7,8-diol, 2-(Benzyloxymethyl)-5-methylfuran, N-[5-(1-Cyano-2-furan-2-yl-vinyl)-[1,3,4]thiadiazol-2-yl]-benzamide, Benzoic acid, 4-methyl-,[4-(methoxycarbonyl) phenyl]methyl ester , Tetrabutyl titanate , 9,10-Secocholesta-5,7,10(19)-triene-3,24,25-triol,(3β,5Z,7E)- , Tertbutyloxyformamide,N-methyl-N-[4-(1-pyrrolidinyl)-2-butynyl]-, α-D-Glucopyranoside, methyl 2-(acetylamino)-2deoxy-3-O-(trime , Strychane , 1-acetyl-20α-hydroxy-16-methylene- , 9-Octadecenamide, (Z)- , Piperidine-1-carboxylic acid,4-(5-hydroxy-4-methyl-2H-pyrazol-3 , Alfa-Copaene , β-copaene , 7-epi-cis-sesquisabinene hydrate , Caryophyllene oxide , Ethyl iso-allocholate , Acetamide , N-methyl-N-[4-[2-acetoxymethyl-1-pyrrolidyl]-2-butyn, 2,5,5,8a-Tetramethyl-4-methylene-6,7,8,8a-tetrahydro-4H,5H-ch- and 2,7-Diphenyl-1,6-dioxopyridazino[4,5:2',3']pyrrolo[4',5'-d]pyridazin.

Keywords: *Annona cherimola, GC-MS, Bioactive, Natural compounds.*

INTRODUCTION

Natural products from microbial sources have been the primary source of antibiotics, but with the increasing recognition of herbal medicine as an alternative form of health care, the screening of medicinal plants for active compounds has become very significant because these may serve as sources of antibiotic prototypes[1, 2]. It has been shown that in vitro screening methods could provide the needed preliminary observations necessary to select crude plant extracts with potentially useful properties for further chemical and pharmacological investigations. Most relatives of cherimoya are native to Central America and southern Mexico, which is an argument in favor of this alternate hypothesis. The cherimoya fruits are classed according to degree of surface irregularity. Cherimoya fruits are widely praised for their excellent organoleptic characteristics, and the species is therefore considered to have a high potential for commercial production and income generation for both small and large-scale producers in subtropical climates. Cherimoya seeds are poisonous if crushed open. Like other members of the family Annonaceae, the seeds contain small amounts of neurotoxic acetogenins,

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such as annonacin. The aim of our research was analysis of the secondary metabolite products of *Annona cherimola* (Graviolla).

MATERIALS AND METHOD

Collection and Preparation of Plant Material

In this research, *Annona cherimola* seed were dried at room temperature for fifteen days and the fine powder was then packed in airtight container[3-15] to avoid the effect of humidity and then stored at room temperature[16-29].

Gas Chromatography-Mass Spectroscopy (GC-MS) analysis

GC-MS analysis of the ethanol extract of *Annona cherimola* was carried out using a (Agilent 7890A series, USA). The powdered sample of *Annona cherimola* was treated for FTIR spectroscopy (Shimadzu, IR Affinity 1, Japan) [30-47]. The sample was run at infrared region between 400 nm and 4000 nm[48-52].

Table 1. Major phytochemical compounds identified in methanolic extract of *Graviolla* seeds.

Serial No.	Phytochemical compound	RT (min)	Molecular Weight	Exact Mass
1.	6-Methoxy-2-phenyl-hexahydropyrano[2,3-b][1,3]dioxine-7,8-diol	3.276	282	282.110338
2.	2-(Benzyloxymethyl)-5-methylfuran	3.407	202	202.09938
3.	N-[5-(1-Cyano-2-furan-2-yl-vinyl)-[1,3,4]thiadiazol-2-yl]-benzamide	4.123	322	322.052446
4.	Benzoic acid , 4-methyl-,[4-(methoxycarbonyl)phenyl]methyl ester	4.334	284	284.104858
5.	Tetrabutyl titanate	4.809	340	340.209307
6.	9,10-Secocholesta-5,7,10(19)-triene-3,24,25-triol,(3β,5Z,7E)-	5.072	416	416.329044
7.	Tertbutyloxyformamide,N-methyl-N-[4-(1-pyrrolidinyl)-2-butynyl]-	5.416	252	252.183778
8.	α-D-Glucopyranoside ,methyl 2-(acetylamino)-2deoxy-3-O-(trime	5.759	373	373.209194
9.	Strychane , 1-acetyl-20α-hydroxy-16-methylene-	5.971	338	338.199429
10.	9-Octadecenamide, (Z)-	6.131	281	281.271864
11.	Piperidine-1-carboxylic acid,4-(5-hydroxy-4-methyl-2H-pyrazol-3	7.104	253	253.142641
12.	Alfa-Copaene	7.710	204	204.1878
13.	β-copaene	7.842	204	204.1878
14.	7-epi-cis-sesquisabinene hydrate	7.979	222	222.198365
15.	Caryophyllene oxide	9.982	220	220.182715
16.	Ethyl iso-allocholate	11.195	436	436.318874
17.	Acetamide , N-methyl-N-[4-[2-acetoxymethyl-1-pyrrolidyl]-2-butyn	11.939	266	266.163042
18.	2,5,5,8a-Tetramethyl-4-methylene-6,7,8,8a-tetrahydro-4H,5H-ch-	12.625	238	238.156895
19.	2,7-Diphenyl-1,6-dioxopyridazino[4,5:2',3']pyrrolo [4',5'-d] pyridazin	15.767	355	355.106924

RESULTS AND DISCUSSION

Chromatogram GC-MS analysis of the methanol extract of *Annona cherimola* showed the presence of nineteen major peaks and the components **Table 1** corresponding to the peaks were determined 6-Methoxy-2-phenyl-hexahydropyrano[2,3-b][1,3] dioxine-7,8-diol , 2-(Benzyloxymethyl)-5-methylfuran , N-[5-(1-Cyano-2-furan-2-yl-vinyl)-[1,3,4] thiadiazol-2-yl]-benzamide, Benzoic acid , 4-methyl-,[4-(methoxycarbonyl)phenyl] methyl ester , Tetrabutyl titanate, 9,10-Secocholesta-5,7,10(19)-triene-3,24,25-triol,(3β,5Z,7E)-, Tertbutyloxyformamide,N-methyl-N-[4-(1-pyrrolidinyl)-2-butynyl]- , α-D-Glucopyranoside ,methyl 2-(acetylamino)-2deoxy-3-O-(trime, Strychane, 1-acetyl-20α-hydroxy-16-methylene-, 9-Octadecenamide, (Z)-, Piperidine-1-carboxylic acid,4-(5-hydroxy-4-methyl-2H-pyrazol-3, Alfa-Copaene, β-copaene , 7-epi-cis-sesquisabinene hydrate, Caryophyllene oxide , Ethyl iso-allocholate, Acetamide, N-methyl-N-[4-[2-acetoxymethyl-1-pyrrolidyl]-2-butyn , 2,5,5,8a-Tetramethyl-4-methylene-6,7,8,8a-tetrahydro-4H,5H-ch- and 2,7-Diphenyl-1,6-dioxopyridazino[4,5:2',3']pyrrolo[4',5'-d]pyridazin.

CONCLUSION

Nineteen chemical alkaloids constituents have been identified from methanolic extract of the *Annona cherimola* by gas chromatogram mass spectrometry (GC-MS). *Annona cherimola* forms a primary platform for further phytochemical and pharmacological investigation for the development of new potential antimicrobial compounds.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Biology, College of Science, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines

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Analysis of Methanolic Fruit Extract of *Citrus aurantifolia* Using Gas Chromatography – Mass Spectrum and FT-IR Techniques and Evaluation of Its Anti-bacterial Activity

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ABSTRACT

The objectives of this study were analysis of the secondary metabolite products and evaluation antibacterial and antifungal activity. Bioactives are chemical compounds often referred to as secondary metabolites. Twenty nine bioactive compounds were identified in the methanolic extract of *Citrus aurantifolia*. The identification of bioactive chemical compounds is based on the peak area, retention time molecular weight and molecular formula. GC-MS analysis of *Citrus aurantifolia* revealed the existence of the Thieno[2,3-c] furan-3-carbonitrile, 2-amino-4,6-dihydro-4,4,6,6, Furfural, 2-Vinyl-9-[3-deoxy-β-d-ribofuranosyl] hypoxanthine, 2-Myristynoyl pantetheine, 2,5-Furandione, dihydro-3-methylene-, Cyclohexene,1-methyl-4-(1-methylethenyl)-,(S)-, O-Acetyl-4-hydroxyproline, 1,5,5-Trimethyl-6-methylene-cyclohexene, Acetic acid, 2-(1-buten-3-yl)-2-nitro-,ethyl ester, Methyl 3-hydroxytetradecanoate, L-α-Terpineol , 4-Methyl itaconate Glycyl-D-asparagine, 2(3H)-Benzofuranone , hexahydro-7a-methyl- , 7-Oxa-2-oxa-7-thiatricyclo[4.4.0.0(3,8)]decan-4-ol, Cholestan-3-ol , 2-methylene-,(3β,5α)- , Formic acid , 3,7,11,-trimethyl-1,6,10-dodecatrien-3-yl ester , 7-epi-cis-sesquisabinene hydrate , 2,5-Cyclohexadien-1-one , 3,5-dihydroxy-4,4-dimethyl-2-(1-oxo , Pyrrolidin-2-one-3β-(propanoic acid, methyl ester), 5-methylen, D-Fructose, diethyl mercaptal , pentaacetate, n-Hexadecanoic acid, 2H-1-Benzopyran-2-one, 5,7-dimethoxy- , Dihydroxanthin, Oleic acid, Octadecanoic acid , Phorbol , 9-Octadecenamide, (Z)- and 9-Octadecenamide.Clinical pathogens were selected for antibacterial activity namely, *Staphylococcus aureus*, *Escherichia coli*, *Proteus mirabilis*, *Klebsiella pneumonia*, and *Pseudomonas eurogenosa*. *Citrus aurantifolia* has maximum zone against *Escherichia coli* 5.66±0.21.

Keywords**:** *Antimicrobial activity, Bioactive compounds, Fruit, GC-MS, Citrus aurantifolia*

INTRODUCTION

Fruit a globose to ovoid berry, 3-6 cm in diameter, sometimes with apical papillae, greenish-yellow; peel very thin, very densely glandular; segments with yellow-green pulp-vesicles, very acid, juicy and fragrant. Seeds small, plump, ovoid, pale, and smooth with white embryos (polyembryonic). The fruit is used in nearly every home in the tropics, mainly to flavour food, but also to prepare drinks and for a variety of medicinal applications. The antifungal activity of the plant have been attributed to the presence of monoterpenes and the plant is currently used as a fungicide for citrus fruit crop, and it has also been suggested that the plant may be a potential candidate used for the protection of food and feeds from toxigenic fungal growth as well as their aflatoxin contamination[1-9]. It has been traditionally used in the management of several diseases and has the prospects of being developed into useful drugs. Citrus fruits are highly recommended for persons suffering from

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kidney stones, gout and arthritis [10-18]. *C. aurantifolia* juice contains potassium citrate which prevents the formation of kidney stones and eases their dissolution. Due to the high content of vitamin C, citrus fruits are used in the treatment of scurvy [19-23]. The aims of our study were analysis of the metabolite products and determination of antimicrobial activity.

MATERIALS AND METHOD

Collection and Preparation of Plant Material

In this research, *Citrus aurantifolia* fruit was dried at room temperature for fifteen days and the fine powder was then packed in airtight container to avoid the effect of humidity and then stored at room temperature [23-37].

Gas Chromatography-Mass Spectroscopy (GC-MS) and Fourier Transform Infrared Spectrophotometer (FTIR) analysis

GC-MS analysis of the ethanol extract of *Citrus aurantifolia* was carried out using a (Agilent 7890A series, USA) [38-41]. The powdered sample of *Citrus aurantifolia* was treated for FTIR spectroscopy (Shimadzu, IR Affinity 1, Japan). The sample was run at infrared region between 400 nm and 4000 nm [42-44].

Determination of antimicrobial activity of crude bioactive compounds of *Citrus aurantifolia*

Antimicrobial activity was evaluated by measuring the zone of inhibition against the test microorganisms. Methanol was used as solvent control [45-47].

Table 1. Major phytochemical compounds identified in methanolic extract of *Citrus aurantifolia*.

Serial No.	Phytochemical compound	RT (min)	Exact Mass
1.	Thieno[2,3-c]furan-3-carbonitrile ,2-amino-4,6-dihydro	3.196	222.0826845
2.	Furfural	3.465	96.021129
3.	2-Vinyl-9-[3-deoxy-β-d-ribofuranosyl]hypoxanthine	3.596	278.101505
4.	2-Myristynoyl pantetheine	3.751	484.297094
5.	2,5-Furandione , dihydro-3-methylene-	4.437	112.016044
6.	Cyclohexene,1-methyl-4-(1-methylethenyl)-,(S)-	4.649	136.1252
7.	O-Acetyl-4-hydroxyproline	4.861	173.068808
8.	1,5,5-Trimethyl-6-methylene-cyclohexene	4.969	136.1252
9.	Acetic acid , 2-(1-buten-3-yl)-2-nitro-,ethyl ester	5.336	187.084458
10.	Methyl 3-hydroxytetradecanoate	5.467	258.219496
11.	L-α-Terpineol	5.891	154.135765
12.	4-Methyl itaconate	6.263	144.042258
13.	Glycyl-D-asparagine	6.549	189.074956
14.	2(3H)-Benzofuranone , hexahydro-7a-methyl-	6.972	154.09938
15.	7-Oxa-2-oxa-7-thiatricyclo[4.4.0.0(3,8)]decan-4-ol	7.235	188.050715
16.	Cholestan-3-ol , 2-methylene-,(3β,5α)-	7.687	400.370516
17.	Formic acid , 3,7,11,-trimethyl-1,6,10-dodecatrien-3-yl ester	8.214	250.19328
18.	7-epi-cis-sesquisabinene hydrate	8.980	222.198365
19.	2,5-Cyclohexadien-1-one,3,5-dihydroxy-4,4-dimethyl-2-(1-oxo	11.275	238.120509
20.	Pyrrolidin-2-one-3β-(propanoic acid, methyl ester), 5-methylen	11.252	311.173273
21.	D-Fructose, diethyl mercaptal , pentaacetate	11.224	496.14369
22.	n-Hexadecanoic acid	13.730	256.24023
23.	2H-1-Benzopyran-2-one , 5,7-dimethoxy-	14.102	206.057909
24.	Dihydroxanthin	14.393	308.162374
25.	Oleic acid	15.423	282.25588
26.	Octadecanoic acid	15.578	284.27153
27.	Phorbol	15.978	364.18859
28.	9-Octadecenamide , (Z)-	17.272	281.271864
29.	9-Octadecenamide	17.323	281.271864

Table 2. Fourier-transform infrared spectroscopic profile solid analysis of *Citrus aurantifolia*.

No.	Peak (Wave number cm-^{1})	Intensity	Type of Intensity	Bond	Type of Vibration	Functional group assignment	Group frequency
1.	661.5	58.395	Strong	C-Cl	Stretch	alkyl halides	600–800
2.	688.5	58.541	Strong	C-Cl	Stretch	alkyl halides	600–800
3.	873.7	73.620	Strong	=C–H	Bending	Alkenes	650-1000
4.	921.9	71.540	Strong	=C–H	Bending	Alkenes	650-1000
5.	1016.1	50.097	Strong	C-F	Stretch	alkyl halides	1000-1400
6.	1047.4	52.070	Strong	C-F	Stretch	alkyl halides	1000-1400
7.	1095.2	60.041	Strong	C-F	Stretch	alkyl halides	1000-1400
8.	1244.7	73.963	Strong	C-F	Stretch	alkyl halides	1000-1400
9.	1317.1	75.349	Strong	C-F	Stretch	alkyl halides	1000-1400
10.	1361.6	73.525	Strong	C-F	Stretch	alkyl halides	1000-1400
11.	1373.3	72.091	Strong	C-F	Stretch	alkyl halides	1000-1400
12.	1394.2	71.347	Strong	C-F	Stretch	alkyl halides	1000-1400
13.	1608.3	69.356	Bending	N-H	Stretch	Amide	1550-1640
14.	1645.9	71.054	Variable	C=C	Stretch	Alkene	1620-1680
15.	2335.2	82.034	Unknown	-	-	-	-
16.	2358.5	75.576	Unknown	-	-	-	-

Table 3. Zone of inhibition (mm) of test bacterial strains to *Citrus aurantifolia* bioactive compounds and standard antibiotics.

/ Citrus aurantifolia Antibiotics	Bacteria				
	Staphylococcus aureus	Escherichia coli	Proteus mirabilis	Klebsiella pneumonia	Pseudomonas eurogenosa
Citrus aurantifolia	4.97±0.20	5.66±0.21	3.98±0.19	3.98±0.20	3.99±0.19
Rifambin	1.09±0.21	1.05±0.19	0.99±0.18	1.03±0.19	1.95±0.18
Streptomycin	0.99±0.18	1.71±0.20	1.07±0.18	0.94±0.17	1.72±0.19
Kanamycin	0.43±0.16	1.00±0.18	1.94±0.14	0.77±0.14	1.63±0.18
Cefotoxime	2.06±0.19	2.05±0.19	1.06±0.15	1.18±0.19	1.03±0.16

Table 4. Zone of inhibition (mm) of fungal strains test to Citrus aurantifolia bioactive compounds and standard antibiotics.

/ Plant Antibiotics	Fungal strains			
	Aspergillus niger	Penicillium expansum	Aspergillus flavus	Trichophyton mentagrophytes
Citrus aurantifolia	2.860±0.16	5.000±0.22	6.160±0.24	4.972±0.21
Amphotericin B	2.771±0.14	3.931±0.21	3.951±0.21	3.813±0.19
Fluconazol	4.655±0.19	2.869±0.23	2.904±0.20	4.614±0.20
Control	0.00	0.00	0.00	0.00

RESULTS AND DISCUSSION

Chromatogram GC-MS analysis of the methanol extract of *Citrus aurantifolia* showed the presence of twenty nine major peaks and the components corresponding to the peaks were determined Thieno[2,3-c]furan-3-carbonitrile,2-amino-4,6-dihydro-4,4,6,6, Furfural, 2-Vinyl-9-[3-deoxy-β-d-ribofuranosyl] hypoxanthine, 2-Myristynoyl pantetheine , 2,5-Furandione , dihydro-3-methylene- , Cyclohexene,1-methyl-4-(1-methylethenyl)-,(S)-, O-Acetyl-4-hydroxyproline, 1,5,5-Trimethy l-6-methylene-cyclohexene , Acetic acid , 2-(1-buten-3-yl)-2-nitro-,ethyl ester, Methyl 3-hydroxytetradecanoate, L-α-Terpineol, 4-Methyl itaconate Glycyl-D-asparagine, 2(3H)-Benzofuranone, hexahydro-7a-methyl-, 7-Oxa-2-oxa-7-thiatricyclo[4.4.0.0(3,8)] decan-4-ol , Cholestan-3-ol , 2-methylene-,(3β,5α)- , Formic acid, 3,7,11,-trimethyl-1,6,10-dodecatrien-3-yl ester, 7-epi-cis-sesquisabinene hydrate , 2,5-Cyclohexadien-1-one , 3,5-dihydroxy-4,4-dimethyl-2-(1-oxo , Pyrrolidin-2-one-3β-(propanoic acid , methyl ester), 5-methylen, D-Fructose, diethyl mercaptal , pentaacetate , n-Hexadecanoic acid , 2H-1-Benzopyran-2-one, 5,7-dimethoxy-, Dihydroxanthin , Oleic acid, Octadecanoic acid, Phorbol , 9-Octadecenamide , (Z)- and 9-Octadecenamide **Table 1**. The FTIR analysis of *Citrus aurantifolia* leaves proved the presence of alkyl halides, Alkenes and Amide which shows major peaks at 661.5, 688.5, 873.7, 921.9, 1016.1, 1047.4, 1095.2, 1244.7, 1317.1, 1361.6, 1373.3, 1394.2, 1608.3, 1645.9, 2335.2 and 2358.5 **Table 2**. In the current study, the anti-microbial activity of *Citrus aurantifolia* methanolic extract was evaluated by determining the zone of inhibition against five bacteria and four fungi. Clinical pathogens were selected for antibacterial activity namely, *Staphylococcus aureus*, *Escherichia coli*, *Proteus mirabilis*, *Klebsiella pneumonia*, and *Pseudomonas eurogenosa*. *Citrus aurantifolia* has maximum zone against *Escherichia coli* (5.66±0.21) **Table 3**. Antifungal activities against *Aspergillus niger, Penicillium expansum*, *Aspergillus flavus* and *Trichophyton mentagrophytes*. *Citrus aurantifolia* was very highly active against *Aspergillus flavus* (6.160±0.24) **Table 4**. In comparison to the antibiotics used in this study, the plants extracts were far more active against the test bacterial strains. However, further studies are needed, including toxicity evaluation and purification of active antibacterial constituents from *Citrus aurantifolia* extracts looking toward a pharmaceutical use.

CONCLUSION

Twenty nine major chemical constituents have been identified from methanolic extract of the *Citrus aurantifolia* by gas chromatogram mass spectrometry (GC-MS). In vitro antimicrobial evaluation of *Citrus aurantifolia* forms a primary platform for further phytochemical and pharmacological investigation for the development of new potential antimicrobial compounds.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Biology, College of Science FOR Women, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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Determination of Anti-microbial Activity and Characterization of Metabolites Produced by *Neisseria gonorrhea*

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ABSTRACT

Neisseria gonorrhoeae, also known as gonococci, or gonococcus, is a species of gram-negative coffee bean-shaped diplococci bacteria responsible for the sexually transmitted infection gonorrhea. The objectives of this study were analysis of the secondary metabolite products and evaluation antimicrobial activity. Thirty nine bioactive compounds were identified in the methanolic extract of *Neisseria gonorrhea*. GC-MS analysis of *Neisseria gonorrhea* revealed the existence of the Butanoic acid , 2-methyl, Propane , 2-methoxy, Hexanoic acid, 2-methyl, 1-Propaneamine, 3-(methylthio), 7-Methylenebicyclo[3.2.0]hept-3-en-2-one, 1,2-Benzisothiazol-3-amine tbdms, Propanoic acid, Benzeneethanamine , N-methyl, Phenelzine, Hexanediamide, N,N'-di-benzoyloxy, Benzeneacetic acid, Silane, methylenebis, Ethanamine, N-ethyl-N-[(1-methylethoxy)methyl], 2-Pentanamine, Butanal, 4-hydroxy-3-methyl, o-Allylhydroxylamine, 2-Butanamine, 3-methyl, Hexanal , 2-chloro, Hexanoic acid, 4-octyl ester, Pyrrolidine , 2,5-dimethyl-1-nitroso, 3-Pentanone , dimethylhydrazone, 1-Pentanol, 2-ethyl, 3-Methyl-1,4-diazabicyclo[4.3.0]nonan-2,5-dione, Pyrrolo[1.2-a]pyrazine-1,4-dione,hexahydro. *Nerium olender* (Alkaloids) was very highly active 6.800±0.24 mm. The results of anti-fungal activity produced by *Neisseria gonorrhea* showed that the volatile compounds were highly effective to suppress the growth of *Aspergillus flavus* (6.800±0.24).

***Keywords*:** Anti-Microbial, *Neisseria gonorrhea*, GC-MS, Secondary metabolites.

INTRODUCTION

Neisseria species are fastidious gram-negative cocci that require nutrient supplementation to grow in laboratory cultures[1]. To be specific, they grow on chocolate agar with carbon dioxide. Symptoms of infection with *N. gonorrhoeae* differ, depending on the site of infection. Note also that 10% of infected males and 80% of infected females are asymptomatic. Men who have had a gonorrhea infection have a significantly increased risk of having prostate cancer. Specific culture of a swab from the site of infection is a criterion standard for diagnosis at all potential sites of gonococcal infection. Cultures are particularly useful when the clinical diagnosis is unclear, when a failure of treatment has occurred, when contact tracing is problematic, and when legal questions arise[2]. Recently, a high-level ceftriaxone-resistant strain of gonorrhea, called H041, was discovered in Japan. Lab tests found it to be resistant to high concentrations of ceftriaxone, as well as most of the other antibiotics tested. Within *N. gonorrhoeae*, there are genes that confer resistance to every single antibiotic used to cure gonorrhea, but thus far they do not coexist within a single gonococcus[3]. Because of N. gonorrhoeae's high affinity for horizontal gene transfer, however, antibiotic-resistant gonorrhea is seen as an emerging public health threat. Transmission can be reduced by the usage of latex barriers, such as condoms or dental dams, during intercourse, oral and anal sex, and by limiting sexual partners. Due to the relative frequency of infection and the emerging development of antibiotic resistance in

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strains of *N. gonorrhoeae*, vaccines are thought to be an important goal in the prevention of infection[4].

MATERIALS AND METHOD

Detection of secondary metabolites

Metabolites was separated from the liquid culture and evaporated to dryness with a rotary evaporator at 45ºC. The residue was dissolved in 1 ml methanol, filtered through a 0.2 µm syringe filter, and stored at 4ºC for 24 h before being used for gas chromatography mass spectrometry [5-11].

Gas chromatography – Mass Spectrum analysis

Neisseria gonorrhea GC–MS analysis were carried out in a GC system (Agilent 7890A series, USA). The flow rate of the carrier gas, helium (He) was set to beat 1 mL min−1, split ratio was 1:50. The injector temperature was adjusted at 250◦C, while the detector temperature was fixed to280◦C [12-19]. The column temperature was kept at 40◦C for 1 min followed by linear programming to raise the temperature from 40◦to 120◦C (at 4 Cº min−1with 2 min hold time), 120 Cº to 170 Cº (at 6 Cº min−1with 1 min hold time) and 170 Cº to 200 Cº (at10◦C min−1with 1 min hold time). The transfer line was heated at 280 Cº. Two microliter of FAME sample was injected for analysis. The components were identified by comparing their retention times to those of authentic samples of WILEY MASS SPECTRAL DATA BASE Library [20-26].

Determination of antibacterial and antifungal activity

Five-millimeter diameter wells were cut from the agar using a sterile cork-borer, and 25 µl of the samples solutions *Nerium olender* (Alkaloids), *Ricinus communis* (Alkaloids), *Datura stramonium* (Alkaloids), *Linum usitatissimum* (Crude), *Cassia angustifolia* (Crude), *Euphorbia lathyrus* (Crude), *Citrullus colocynthis* (Crude), *Althaea rosea* (Crude), *Coriandrum sativum* (Crude), *Origanum vulgare* (Crude), *Urtica dioica* (Crude), *Foeniculum vulgare* (Crude), and *Punica granatum* (Crude) were delivered into the wells. The plates were incubated for 48 h at room temperature. Antimicrobial activity was evaluated by measuring the zone of inhibition against the test microorganisms [27-32]. The studied fungi, *Microsporum canis*, *Streptococcus faecalis*, *Aspergillus flavus*, *Penicillium expansum*, *Trichoderma viride, Trichoderma horzianum*, *Aspergillus niger* and *Aspergillus terreus* were isolated and maintained in potato dextrose agar slants. Spores were grown in a liquid culture of potato dextrose broth (PDB) and incubated at 25ºC in a shaker for 16 days at 130 rpm. The extraction was performed by adding 25 ml methanol to 100 ml liquid culture in an Erlenmeyer flask after the infiltration of the culture. Methanol was used as solvent control. Amphotericin B and fluconazole were used as reference antifungal agent. The tests were carried out in triplicate. The antifungal activity was evaluated by measuring the inhibition-zone diameter observed after 48 h of incubation [33-37]. All the measurements were replicated three times for each assay and the results are presented as mean ± SD and mean ± SE. IBM SPSS 20 version statistical software package was used for statistical analysis of percentage inhibition and disease incidence and disease severity in each case.

Table 1. Major chemical compounds identified in methanolic extract of *Neisseria gonorrhoeae*.

Serial No.	Phytochemical compound	RT (min)	Molecular Weight
1.	Butanoic acid , 2-methyl-	3.173	102.06807
2.	Propane , 2-methoxy-	3.367	74.073165
3.	Hexanoic acid , 2-methyl-	3.533	130.09938
4.	1-Propaneamine , 3-(methylthio)	4.134	105.06122
5.	7-Methylenebicyclo[3.2.0]hept-3-en-2-one	3.808	120.057514
6.	1,2-Benzisothiazol-3-amine tbdms	4.517	264.11164
7.	Propanoic acid	4.912	74.0367794
8.	Benzeneethanamine , N-methyl	5.324	135.104799
9.	Phenelzine	5.364	136.100048
10.	Hexanediamide , N,N’-di-benzoyloxy	5.845	384.132137
11.	Benzeneacetic acid	6.777	136.052429

Cont... **Table 1. Major chemical compounds identified in methanolic extract of *Neisseria gonorrhoeae*.**

12.	Silane , methylenebis	7.315	76.0164533
13.	Ethanamine , N-ethyl-N-[(1-methylethoxy)methyl]	7.922	145.146665
14.	2-Pentanamine	8.013	87.1047993
15.	Butanal , 4-hydroxy-3-methyl-	7.819	102.068079
16.	o-Allylhydroxylamine	9.072	73.052764
17.	2-Butanamine , 3-methyl	8.357	87.1047993
18.	Hexanal , 2-chloro-	9.032	134.049843
19.	Hexanoic acid , 4-octyl ester	10.399	228.20893
20.	Pyrrolidine , 2,5-dimethyl-1-nitroso-	11.550	128.094963
21.	3-Pentanone , dimethylhydrazone	11.527	128.131349
22.	1-Pentanol , 2-ethyl-	11.979	116.120115
23.	3-Methyl-1,4-diazabicyclo[4.3.0]nonan-2,5-dione ,	12.196	210.100442
24.	Pyrrolo[1.2-a]pyrazine-1,4-dione,hexahydro-	12.848	154.074227
25.	2-Undecene , (Z)	13.323	154.172151
26.	3,5,5-Trimethylhexyl acetate	13.432	186.16198
27.	Pentanedinitrile , 2-methyl-	13.936	108.068748
28.	Decanoic acid , 2-methyl-	14.302	186.16198
29.	trans-2,3-Epoxynonane	14.931	142.135765
30.	Cyclopentane , butyl	15.973	126.140850
31.	Oleic acid	16.339	282.25588
32.	Octadecanoic acid	16.533	284.27153
33.	DL-Leucine , N-DL-leucyl	17.077	244.178693
34.	5-Chlorovaleric acid ,morpholide	17.357	205.086956
35.	2-Propanamine,2-methyl-N2-[1-tetrahydro-1h-1-pyr	17.380	154.146998
36.	Fumaric acid , 3-heptyl propyl ester	20.504	256.16746
37.	Benzene ,[1-(methoxymethoxy)-2-propynyl]	21.414	176.08373
38.	Benzenepropanoic acid , 3,5-bis(1,1-dimethyethyl)	24.802	530.469894
39.	Propanoic acid, 2,2-dimethyl-,2,6-bis(1methylethyl	25.036	262.19328

Table 2. Antifungal activity of Neisseria gonorrhoeae metabolite products.

Fungi	**Antibiotics /** *Neisseria gonorrhoeae* **metabolite products**			
	Neisseria gonorrhoeae **metabolite products**	**Amphotericin B**	**Fluconazol**	**Miconazole nitrate**
Microsporum canis	2.906±0.18 [a]	2.006±0.10	3.014±0.12	2.881±0.19
Streptococcus faecalis	2.900±0.19	3.013±0.14	2.881±0.13	1.794±0.11
Aspergillus flavus	6.007±0.22	3.006±0.14	3.792±0.17	2.995±0.16
Penicillium expansum	4.009±0.16	3.025±0.18	2.839±0.13	1.892±0.15
Trichoderma viride	4.939±0.20	1.974±0.11	2.005±0.12	3.485±0.19
Trichoderma horzianum	3.992±0.20	1.001±0.02	4.001±0.19	2.992±0.16
Aspergillus niger	5.011±0.19	1.968±0.12	3.751±0.17	2.016±0.15
Aspergillus terreus	4.980±0.20	3.061±0.15	2.957±0.18	3.079±0.18

[a] The values (average of triplicate) are diameter of zone of inhibition at 100 mg/mL crude extract and 30 µg/

mL of (Amphotericin B; Fluconazol and Miconazole nitrate).

Table 3. Zone of inhibition (mm) of test different bioactive compounds and standard antibiotics of medicinal plants to *Neisseria gonorrhoeae*.

S. No.	Plants	Zone of inhibition (mm)
1.	*Nerium olender* (Alkaloids)	6.800±0.24
2.	*Ricinus communis* (Alkaloids)	3.904±0.18
3.	*Datura stramonium*(Alkaloids)	4.005±0.19
4.	*Linum usitatissimum* (Crude)	4.891±0.20
5.	*Cassia angustifolia* (Crude)	5.407±0.23
6.	*Euphorbia lathyrus* (Crude)	5.966±0.23
7.	*Citrullus colocynthis* (Crude)	3.893±0.17
8.	*Althaea rosea* (Crude)	5.933±0.22
9.	*Coriandrum sativum* (Crude)	6.004±0.23
10.	*Origanum vulgare* (Crude)	6.010±0.23
11.	*Urtica dioica* (Crude)	3.881±0.20
12.	*Foeniculum vulgare* (Crude)	3.005±0.19
13.	*Punica granatum* (Crude)	6.015±0.23
14.	Control	0.00

RESULTS AND DISCUSSION

Gas chromatography and mass spectroscopy analysis of compounds was carried out in methanolic extract of *Neisseria gonorrhea*, shown in **Table 1.** The GC-MS chromatogram of the twenty nine peaks of the compounds detected were determined to be Butanoic acid , 2-methyl, Propane , 2-methoxy, Hexanoic acid, 2-methyl, 1-Propaneamine , 3-(methylthio), 7-Methylenebicyclo[3.2.0]hept-3-en-2-one, 1,2-Benzisothiazol-3-amine tbdms, Propanoic acid, Benzeneethanamine, N-methyl, Phenelzine, Hexanediamide, N,N'-di-benzoyloxy, Benzeneacetic acid, Silane, methylenebis, Ethanamine , N-ethyl-N-[(1-methylethoxy)methyl], 2-Pentanamine, Butanal, 4-hydroxy-3-methyl,o-Allylhydroxylamine, 2-Butanamine , 3-methyl, Hexanal , 2-chloro, Hexanoic acid, 4-octyl ester, Pyrrolidine, 2,5-dimethyl-1-nitroso, 3-Pentanone, dimethylhydrazone, 1-Pentanol, 2-ethyl, 3-Methyl-1,4-diazabicyclo[4.3.0]nonan-2,5-dione, Pyrrolo[1.2-a]pyrazine-1,4-dione,hexahydro, 2-Undecene, (Z), 3,5,5-Trimethylhexyl acetate, Pentanedinitrile, 2-methyl, Decanoic acid, 2-methyl, trans-2,3-Epoxynonane, Cyclopentane, butyl, Oleic acid, Octadecanoic acid, L-Leucine, N-DL-leucyl, 5-Chlorovaleric acid ,morpholide, 2-Propanamine,2-methyl-N2-[1-tetrahydro-1h-1-pyr, Fumaric acid , 3-heptyl propyl ester, Benzene ,[1-(methoxymethoxy)-2-propynyl], Benzenepropanoic acid, 3,5-bis (1,1-dimethyethyl), Propanoic acid, 2,2-dimethyl-,2,6-bis(1methylethyl. The results of anti-fungal activity produced by *Neisseria gonorrhea* showed that the volatile compounds were highly effective to suppress the growth of *Aspergillus flavus*. *Neisseria gonorrhea* produce many important secondary metabolites with high biological activities. Based on the significance of employing bioactive compounds in pharmacy to produce drugs for the treatment of many diseases, the purification of compounds produced by *Neisseria gonorrhea* can be useful. Maximum zone formation against *Aspergillus flavus* (6.007±0.22) mm, **Table 2**. In agar well diffusion method the selected medicinal plants *Nerium olender* (Alkaloids), *Ricinus communis* (Alkaloids), *Datura stramonium*(Alkaloids), *Linum usitatissimum* (Crude), *Cassia angustifolia* (Crude), *Euphorbia lathyrus* (Crude), *Citrullus colocynthis* (Crude), *Althaea rosea* (Crude), *Coriandrum sativum* (Crude), *Origanum vulgare* (Crude), *Urtica dioica* (Crude), *Foeniculum vulgare* (Crude), and *Punica granatum* (Crude) were effective against *Staphylococcus aureus*, **Table 3**. *Nerium olender* (Alkaloids) was very highly active (6.800±0.24) mm against *Neisseria gonorrhea*.

CONCLUSION

Thirty nine bioactive chemical constituents have been identified from methanolic extract of the *Neisseria gonorrhea* by gas chromatogram mass spectrometry (GC-MS). In vitro antifungal evaluation of secondary metabolite products of *Neisseria gonorrhea* forms a primary platform for further chemical and pharmacological investigation for the development of new potential antimicrobial compounds. *Neisseria gonorrhea* produce many important secondary metabolites with high biological activities.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were

approved under the Department of Biology, College of Science for Women, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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A Revised Checklist of the Blister Beetles Genera (Coleoptera, Meloidae) from Iraq

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ABSTRACT

Meloide are usually referred to as "blister beetles" due to the toxin, cantharidin, typically found within their bodies that can cause blistering of human skin. Several meloide species have long histories of adversely impacting agriculture resulting from large aggregations foraging on crops and negatively impacting livestock health. Blister beetles also have a complex and interesting development. Amazingly, even with these important and interesting faces, little is known about these beetles in their natural habitats. A revised checklist of the blister beetles genera (Coleoptera, Meloidae) was given during this study in Iraq. The investigation showed (13) genera belonging to two subfamilies, three genera new recorded to entomofauna of Iraq (Lydomorphus Fairmaire, 1882, Zonitis Fabricius, 1775, Alosimus Mulsant, 1857).

Keywords: *Meloidae, Coleoptera, Genera, new recorded, Iraq, Blister beetles.*

INTRODUCTION

The family of blister beetles (Meloidae) is a large family belongs to the main family of Coleoptera. It is estimated that there are 3,000 species of this family in the world. About 120 species of this type are found in most parts of the world, especially the arid, semi-arid and sub-polar areas[1]. Some species attack crops such as grit, cowpea, soybeans and bush [2]. The larvae of this family are predators of some insects, and they feed on locust eggs and are therefore important in the natural pest control program[3]. Blister beetles have medical and veterinary importance, as their secretions of Cantharidin bring about human skin burns[4]. It also affects livestock after harvesting crops and cutting grasses, killing many of these beetles and the effects of Cantharidin on harvested plants, which in turn lead to the death of cattle when they are eaten[5]. Cantharidin has long been used as a medicine in various diseases and also used in cosmetics[6]. Cantharidin has also been developed and used as a new type of biocides as highly effective as an insecticide[7]. Selander (1966) classifies the family to three sub-families depending on differences in gender:Nemognathinae, Eleticinae Meloinae. While Pinto (1999) divides the family in the New World to three sub-families: NemognathinaeMeloinae, Tetraonycinae depending on several characteristics including male virility, and phenotypic features of the first larval stage. The general characteristics of the family of the blister beetles are: Day-time active insects. They are bright and shiny, the body is long-being and narrow, the size is between 4-30 mm, the parts of the mouth are biting chewing of hypognathous mouth in type, the horn of the sensor is Filliform or Moniliform in some species, the sensor's horn is transformed in some species, consisting of 11 brains, except the Cerocomini family, consisting of 7-10 brains, the wrist equation is 5-5-4. The previous characteristics were agreed upon by researchers[6,8-10, 23].

MATERIAS AND METHOD

Many samples of blister beetles were collected through a wide network of agricultural areas from several regions of Iraq during 2016-2018. The species stored at the Iraqi Natural History Research and Museum Center at Baghdad University were also used. The blister beetles were then killed by freezing for 24 hours. Samples were

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sculptured using special insects pin and kept in insect gathering boxes until being diagnosed. The samples were examined with a Binocular Dissecting Microscope. The Dino-Lite Digital Microscope was used to film the species being studied. Numerous classification keys were used to identify and diagnose species, such as: 6, 13, 14, 15, 16,17, 18.

RESULTS AND DISCUSSION

In this study the survey showed thirteen genera belonging to two subfamilies; also the other genera that have not been gotten throughout the period of the current work were referred to them and global distribution had been as fallow:

Subfamily: Meloinae Gyllenhal, 1810

Genus: *Lydomorphus* Fairmaire, 1882

Distribution: Afrotropical, Neotropical, Oriental and Palearctic regions (Insectoid Info.).

Material Examined: Seven specimens were collected from Babylon during 8-9 april 2016, this genus as a new record to Iraq.

Genus: *Mylabris* Fabricius, 1775

In Iraq this genus represented as *Mylabris syriaca* Klug,1834, is recorded to Iraq by [19].

Distribution: Australian, Afrotropical, Neotropical, Nearctic, Oriental and Palearctic regions [6].

Material examined: There were three male specimens which collected from Babylon at 2 april 2016.

The species *Mylabris tenebrosa* Laporte de Castelnau,1840, was collected from Babylon at 1 april 2016.

Genus: *Epicauta* Dejean, 1834

In Iraq this genus represented as *Epicauta hirticornis* (Haag-Rutenberg,1880), this species as a new record in Iraq**.**

Distribution: Afrotropical, Neotropical, Nearctic, Oriental and Palearctic regions [6].

Material examined: There were 12 specimens which collected from Babylon at 2 may

2016 and 5 specimens which collected from Baghdad at 5 april 2017.

Genus: *Croscherichia* (Pardo Alcaide, 1950)

In Iraq this genus represented as *Croscherichia goryi* (Marseul,1870), is recorded to Iraq by [20].

Distribution: Afrotropicl and Palearctic Regions [21]

Material examined: There were two female specimens which collected from Babylon at 7 may 2016.

Genus: *Lytta* Fabricius, 1775

Distribution: Afrotropical, Nearctic, Neotropical, Oriental and Palearctic Regions [6].

Material examined: Twelve samples was collected from Babylon and Diyala at 22, 27 april 2016 as *Lytta nitidula* Fabricius, 1775, this species as a new record to Iraq

Genus: *Cerocoma* Geoffr, 1762

In Iraq this genus represented as *Cerocoma scovitzi* Faldermann, 1837, is recorded to Iraq by [20].

Distribution: Afrotropical, Neotropical, Nearctic, Oriental and Palearctic regions (Insectoid Info.).

Material examined: There were two female specimens which collected from Babylon at 11 may 2016.

The species *Cerocoma graeca* Maran, 1944, was collected from Babylon and Diyala at 10-22 may 2016, this species as a new record to Iraq.

Genus: *Lydus* Dejean, 1821

In Iraq this genus represented as *Lydus algiricus* (Linnaeus, 1758), is recorded to Iraq by [22].

Distribution: Afrotropical, Nearctic, Oriental and Palearctic Regions (Insectoid Info.).

Material examined: There were two female specimens which collected from Babylon at 29 april 2016.

Genus: *Meloe* Linnaeus, 1758

In Iraq this genus represented as *Meloe coriarius* Brandt & Erichson, 1832, is recorded to Iraq by [22].

Distribution: Afrotropical, Neotropical, Nearctic,

Oriental and Palearctic regions (6).

Material examined: There were Three Male specimens which collected from Karbala and Diwanieh at 14-26 april 2017.

Genus: *Oenas* Latreille, 1802

In Iraq this genus represented as *Oenas crassicornis* (Illiger, 1800),, is recorded to Iraq by [22].

Distribution: Afrotropical, Neotropical, Nearctic, Oriental and Palearctic regions (Insectoid Info.).

Material Examined: There were two Male specimens which collected from Sulaymaniyah at 4 March 2018.

Genus: *Alosimus* Mulsant, 1857

Distribution: Afrotropical, Neotropical, Nearctic, Oriental and Palearctic regions (Insectoid Info.)

Material examined: There were Three Male specimens which collected from maysan at 5 may 2017. this genus as a new record to Iraq.

Subfamily: Nemognathinae Laporte de Castelnau, 1840

Genus: *Zonitis* Fabricius, 1775

Distribution: Australian, Afrotropical, Neotropical, Nearctic, Oriental and Palearctic regions (Insectoid Info.).

Material Examined: as *Zonitis immaculata* (Olivier, 1789) Twelve specimens which collected from Babylon and Diyala at 2-3 may 2016, and *Zonitis fernancastroi* Pardo Alcaide,1950 Three Specimens which collected from Babylon and Najaf at 3-11 may 2016. This genus as new record for Iraq.

Genus: *Nemognatha* Illiger, 1807

In Iraq this genus represented as *Nemognatha chrysomelina* (Fabricius, 1775), is recorded to Iraq by [19].

Distribution: Australian, Afrotropical, Neotropical, Nearctic, Oriental and Palearctic regions (Insectoid Info.).

Material Examined: Three specimens were collected from Babylon and Diyala during 6-15 May 2016.

Genus: *Euzonitis* Semenov, 1893

Distribution: Afrotropical, Oriental and Palearctic regions (Insectoid Info.).

Material Examined: The species *Euzonitis quadripunctata* (Faldermann,1801), was found of Iraq[20].

CONCLUSION

This study showed 13 genera under two subfamilies belonging to the blister beetles family Meloidae, and three genera were recorded as new record for Iraqi fauna. The most genera were founded in the middle and western of Iraq. The survery of this family in future must be include all regions of Iraq and may be found new records or as new species for the world.

Financial disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Science- Basic Education College, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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