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Sustainable Development Goals (SDGs)-Challenges for India

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ABSTRACT

The world economies have unified in their efforts to achieve the goals of sustainable development. This is in sheer contrast to the earlier approaches where governments pursued goals for the growth and development of their respective economies. The struggle for growth and excellence has created imbalance in the economic development among countries, depleted some of the natural resources and has thus altered the ecological balance. The impact of this is being experienced in the form of global warming and climate change. Since this threatens the very existence of human life on earth, a course of action that would ensure a safe environment for future generations has become the need of the hour. Sustainable development is a term coined to ensure that development takes place in such a way that natural resources are sustained and passed on to the future generations unimpaired. This paper makes an attempt to understand the challenges encountered by India in achieving Sustainable development goals and offers suggestions to overcome them.

Keywords: *Millennium Development Goals (MDG), Sustainable Development Goals (SDG), Ibrahim Index of African Governance (IIAG)*

INTRODUCTION

Sustainable Development has become the buzz word of the international community. The struggle for growth and excellence has created imbalance in the economic development among countries, depleted some of the natural resources and has thus altered the ecological balance. Since this threatens the very existence of human life on earth, a course of action that would ensure a safe environment for future generations has become the need of the hour. Sustainable development is a term coined to ensure that development takes place in such a way that natural resources are sustained and passed on to the future generations unimpaired. Seventeen Sustainable Development Goals (SDGs) aimed to build a more prosperous, more equal, and more secure world by the year 2030 have been developed. They have been adopted by 193 Member States at the UN General Assembly Summit in September 2015 as a part of their agenda for Sustainable Development. India is a signatory to this summit and is strongly committed to the 2030 agenda.

At this juncture this paper makes an attempt to understand the challenges encountered by India in achieving the Sustainable development goals. The paper also makes an attempt to suggest measures to overcome the challenges.

The Sustainable Development Goals: The Sustainable Development Goals (SDGs) which came into effect on 1 January, 2016 is an improvement on the Millennium Development Goals (MDGs)[1]. In India, as far as MDGs are concerned, considerable progress has been made in the field of basic universal education, gender equality in education, and global economic growth. However there was slow progress in the improvement of health indicators related to mortality, morbidity, and various environmental factors contributing to poor health conditions[2].With SDGs in place the Indian government is now trying to integrate the efforts taken towards achieving MDGs with SDGs. SDGs are wider in scope. The 17 SDGs are as follows

Goal 1	End poverty in all its forms everywhere
Goal 2	End hunger, achieve food security and improved nutrition and promote sustainable agriculture
Goal 3	Ensure healthy lives and promote well-being for all at all ages
Goal 4	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Goal 5	Achieve gender equality and empower all women and girls

Contd…

Goal 6	Ensure availability and sustainable management of water and sanitation for all
Goal 7	Ensure access to affordable, reliable, sustainable and modern energy for all
Goal 8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Goal 9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
Goal 10	Reduce inequality within and among countries
Goal 11	Make cities and human settlements inclusive, safe, resilient and sustainable
Goal 12	Ensure sustainable consumption and production patterns
Goal 13	Take urgent action to combat climate change and its impacts*
Goal 14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development
Goal 15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
Goal 16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
Goal 17	Strengthen the means of implementation and revitalize the global partnership for sustainable development

Fig. 1: Sustainable Development Goals

Source: www.un.org/sustainabledevelopment/sustainable-development-goals/

Sustainable Development Goals have been built on the universal principle of 'leave no one behind' [3] As far as India is concerned, the national development goals of India, converge well with the SDGs and India is expected to play a leading role in determining the success of the SDGs, globally[4].

Measures taken for implementing SDGs in India: NITI Aayog, the Government of India's premier think tank, has been entrusted with the task of coordinating the SDGs. States have also been advised to undertake a similar mapping of their schemes, including centrally sponsored schemes.

In addition, the Ministry of Statistics and Programme Implementation (MoSPI) is engaged in the process of developing national indicators for the SDGs.[5]

Many of the Government's flagship programmes such as Swachh Bharat, Make in India, Skill India, and Digital India are at the core of the SDGs. State and local governments play a pivotal role in many of these programmes.[6] State governments are paying keen attention to visioning, planning, budgeting, and developing implementation and monitoring systems for the SDGs.[7]

UN Support for SDG initiatives in India: The United Nations in India supports the participation of civil society organisations, think tanks and the Indian media in discussions and side sessions at the International Conference on Financing for Development at Addis Ababa and during the General Assembly in New York.[8]

The UN Country Team in India supports NITI Aayog in its efforts to address the interconnectedness of the goals, to ensure that no one is left behind and to advocate for adequate financing to achieve the SDGs [9]. In close collaboration with NITI Aayog and partners, the UN has supported thematic consultations on the SDGs to bring together various state governments, central ministries, civil society organisations and academia to deliberate on specific SDGs.[10]

Support to State Governments: The UN in India currently supports five State governments (Assam, Chhattisgarh, Gujarat, Haryana, and Odisha) in localising the SDGs to address key development challenges at the state level.[11]

Challenges in attaining SDGs in India: Four areas have been identified as areas of concern for India in Achieving SDGs [12]. They are discussed below

Defining Indicators: One of the major challenges for India is devising suitable indicators to effectively monitor the progress of SDGs. India's past records reveal that it has not been very successful in setting relevant indicators to measure outcomes. The definition for "safe" drinking water has been misconstrued with the availability of hand pumps and tube wells and the official data suggested that 86% of Indians had access to safe drinking water and therefore were "on track" for the MDG goal on drinking water. But the number of waterborne diseases and deaths due to diarrhea are quite high in India.

Financing SDGs: Despite India's best efforts to reduce poverty it has the highest number of people living below international poverty line. As per the World Bank report 2013, 30 per cent of its population was under the $1.90-a-day poverty measure. [13] According to the United Nations MDG 2014 report, despite high economic growth, in 2010, one-third of the world's 1.2 billion extreme poor lived in India alone. [14] At today's level of investment – public and private in SDG related sectors in developing countries, an average annual funding shortfall over 2015-2030 of some $2.5 trillion remains. [15] This gap can be bridged only through increased private sector investments, especially in infrastructure, food security and climate change mitigation sectors.
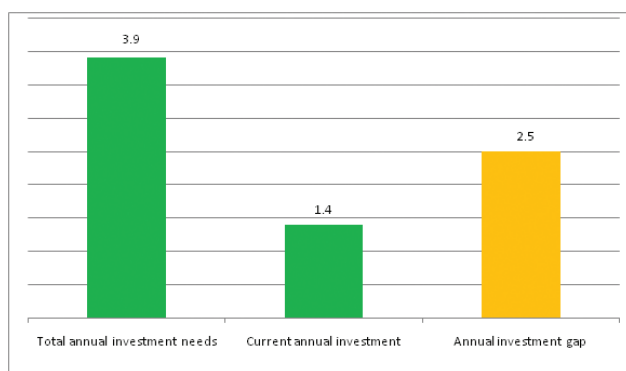
Fig. 2: Gap in funding SDGs in developing countries

Source: unctad.org/en/pages/PressRelease. aspx?OriginalVersionID=194

In India, A new study estimates that implementing SDGs in India by 2030 will cost around US$14.4 billion.[16] Given the recent cut in social sector schemes in India there is likely to be a significant funding gap.[17]

Monitoring and Ownership: A third significant challenge in implementing SDGs would be with respect to ownership. Though NITI Aayog is expected to play the lead role in tracking the progress of SDGs, its members have expressed reservations on being able to take on this mammoth task.

Measuring Progress: The last challenge is how to measure the progress or achievement of SDGs. The Indian government has admitted that non-availability of data (particularly in respect to sub-national levels), periodicity issues and incomplete coverage of administrative data, have made accurate measuring progress of even MDGs virtually impossible.

Measures to overcome Challenges: The challenges discussed above can be overcome by developing an exclusive model for implementing, monitoring, measuring and reporting SDG related course of action. Though India has well established organizations such as the CSO to provide statistical data many times they are general and do not match specific requirements. Even in case of MDGs, India was not able to measure its achievement accurately because of lack of data. Therefore developing suitable indicators to assess the progress of SDGs and also simultaneously developing a system that can support this exercise by supplying the required data is of paramount importance.

A separate index for measuring the progress or achievement of SDGs can be developed by taking the Ibrahim Index of African Governance (IIAG) as a base.

Ibrahim Index of African Governance (IIAG) [18]: The Ibrahim Index of African Governance (IIAG) measures the quality of governance in every African country on an annual basis. The IIAG was launched in 2007 and has evolved to be the most comprehensive assessment on African governance. As governance is not measurable directly, IIAG has developed the most suitable set of proxy indicators for the purpose by making use of a variety of data sources and indicators. IIAG does not collect primary data, but rather collates data provided by respected external sources. The IIAG data set is updated every year when practical improvements are identified and the results are made available from 2000. Whenever new historical data are made available, or the structure of the IIAG is strengthened, the entire data set is updated back to 2000. The latest 2016 IIAG consists of 95 indicators from 34 data providers.

Techniques used in developing IIAG: Some of the techniques used in developing IIAG are worth noting and may be applied in the Indian context also.

- **Clustered indicators:** Indicators measuring a specific governance concept are sometimes available from multiple sources. To improve the accuracy of the indicator measurement and avoid double counting, these measures are combined into a single clustered indicator, which is the average of its underlying sub-indicators.

- **Handling missing data:** Most indicators included in the IIAG have missing data points over the time series. As this can have an effect on a country's

aggregate scores, estimates are provided for missing data, following a statistical process called imputation. According to this process, if data is missing outside the time series, it is replaced by an existing data point. When data is missing inside the time series, these are replaced with numbers incrementally higher or lower than the neighbouring data points.

- **Normalisation:** Given that the data utilised in the construction of the IIAG come from 35 separate data providers that present their data on different scales, it is necessary to standardise all data. This is done through a statistical process called normalisation whereby raw data for each indicator are transformed by the min-max normalisation method. This process allows all scores to be published in common units and within the same bounds of 0-100, where 100 is always the best possible score.

- **Data aggregation:** The IIAG uses a transparent, simple and replicable method of data aggregation. A simple average is calculated using the structure of the Index to arrive at the Overall Governance scores.

All of the above four techniques are ideal and very much applicable for India. The Administrative system in India is highly bureaucratic with two Governments, one at the centre and the other at the state level. This has resulted in duplication of data. Even the available has gaps in it and suffers from errors of standardization. All this can be resolved by developing an Indian Index of Sustainable Development (IISD) by following the techniques discussed above. IISD can be developed for a period of 15 years from 2015-30. The data set can be updated every year according to recent developments and revised for all the 15 years by following the same pattern of Ibrahim index. This would ensure availability of the most recent data set.

Financing SDGs.: The challenge of financing SDGs can be resolved to some extent by strengthening the existing academic infrastructure in the nation. India is a regional hub for higher education and boasts itself for being the home town of several renowned institutions such as IIT and IIM. These institutions have well developed infrastructure for research. These resources can be pooled and effectively utilised in designing, developing and measuring indicators meant for sustainable development.

In developing countries like India, there was some hesitation in reducing carbon emissions for two reasons, first their per capita emissions were lower, second, it would mean compromising with the development of the nation.[19] Therefore a carbon trading system was evolved among the countries of the world where firms were permitted to emit carbon within the prescribed limit and were assigned carbon credits for this purpose If any firm wants to exceed the limit it can buy the unused credit from another firm. In this way the buying firm is penalized for exceeding its carbon quota and the selling firm is rewarded for reducing its emissions. Governments can consider the idea of penalizing firms with higher carbon footprints by making them finance the sustainable goal programmes in the developing and least developed countries.

The responsibility of implementing SDGs: With NITI Ayog expressing its doubt as to how far it would succeed in this laborious task it is high time the Indian Government decentralises this task and while doing so it must be borne in mind that SDGs aim at conserving and passing on the natural resources to the next generation. This cannot be done without involvement of the society. But a society so knowledgeable to use its natural resources in a perfectly ecologically sound manner is nearly impossibility. Changing social, political, cultural, technological and ecological conditions will exert new pressures on the natural resource base and the possibility of its misuse or overuse always remains [20]. Therefore a political order in which decision making will be done by those who would suffer the consequences of those decisions would be ideal. A new system that would ensure participation from groups that are directly connected to the problem needs to be evolved.

CONCLUSION

India is a country with the second largest population in the world. The steps taken by India for the achievement of SDGs matter a lot to the world. If India succeeds in attaining the SDGs it would mean a larger section of the world has achieved it. Therefore it is imperative for India to develop effective methods for implementing, monitoring and measuring the progress of SDGs. The biggest challenge for India seems to be the development of suitable indicators. This can be handled by developing an Indian Index for Sustainable Development (IISD) by taking the Ibrahim index as a base.

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A Study on Quality of Work Life With Reference to Logistics Industry, Sriperumbudur

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ABSTRACT

In the present Scenario,Quality of Work Life(QWL) can be viewed as the umbrella under which employees feel fully satisfied with the working environment and extend their wholehearted cooperation and support to the management to improve productivity and healthy work environment. Especially most of the Professionals today, seem to be more interested towards the jobs which them increased flexibility at work. QWL can be viewed as an alternative to manage people in the Organizations. The QWL approach considers people as an 'asset' to the organization rather than as 'costs'. It believes that people perform better when they are allowed to participate in managing their work and make decisions. In this present study it is used to find out the " Quality of Work Life " among Logistics Industry. A sample size of 50 was collected through structured Questionnaire. The present study was derived from by using statistical tools like Chi-Square, One-way Anova, Correlation etc. To satisfy the present generation workforce, organizations need to concentrate on job designs and organization of work. The present study supports the researchers to identify the concept of Quality of Work Life.

Keywords: *Quality of Work Life, Work Environment, Productivity,Work force.*

INTRODUCTION

"Quality of Working Life" (QWL) is a term that had been used to describe the broader job-related experience an individual has. Quality of Work Life helps to make an experimental analysis among the employee circle which results in satisfaction and could relate with the work force and target accomplishment, that will bring easy management to narrow the understand between the organization and employees.

Role of Human Resource Department and scenario on the need for QWL on the Indian work-norms, as their Unions are defensive. They are now more interested in the question of how to retain their jobs than in the question of how to improve their Quality of Life in the work place. Gives out measure to improve QWL, through Employee Involvement which makes a sense of responsibility and participation in decisions and made a part of organization's culture and management's philosophy. It inhibits experience and personal effectiveness and exhibits itself through results and behavior among the environment

REVIEW OF LITERATURE

An overview of A.Jayakumar (2012)[1], relates to people circling industrial posture, measures of quality on economic and social polishing. Employee's QWL improves their attitude to task, resulting in quotient to the enterprise. Various problems like job dissatisfaction, boredom, absenteeism, lack of commitment came up.[p145] An assured good Quality of Work Life will not only attract young and new talent but also retain the existing experience talent. Jerome(2013)[2], opines that Quality of Worklife helps to facilitates the Human resources development, also motivates the employees to go with current and future roles in the Organization. Employees should improve QWL by introducing participative problem solving, restructuring work, and improving work environment[p(52)]. QWL helps to understand how the employees are treated by the top level management. Shefali Srivastava& Rooma Kanpur (2014)[3] , quality can be computed only when the work carry certain strains like, it should not put workers under undue stress. It should not damage or degrade their humanness. It should not be threatening or unduly dangerous. It should at least

leave unimpaired, workers' abilities to perform in other life roles, such as citizen, spouse and parent. QWL is a process in an organization which enables its members at all levels to participate actively and effectively in shaping organizational environment, methods and outcomes. QWL seeks to employ the higher skills of workers and to provide an environment that encourages them to improve their skills which defines an outcome to formulate organizational efficiency[p(55)]. The outcome factors the effects on psychology of employees (positive attitudes, commitment, and satisfaction) and ultimate effects on performance of organization are being considered by researchers. Indrani & Suma Devi (2014)[4] covers a person's feelings about every dimension of work including economic rewards and benefits, security, working condition, Organizational and interpersonal relations and its intrinsic meaning in person's life. The study recommended that promotion policies can be improved by giving grade for designation according to the experience of the employees[p(101)]. Latest trends like, ethics, quality of work life (QWL) and job satisfaction are now considered important predictors of sustainability and viability of business organizations. Nishiriyanargees & Gurudatt Kamath(2016)[5], articulated that QWL has become a crucial factor to achieve the goals in almost all the organizations. QWL helps to develop healthy working environment as well as highly satisfied workforce[p(58)]. QWL helps in changing organizational climate by humanizing work, individualizing the organization etc.

OBJECTIVES OF THE STUDY

- To understand the employees psychological balance & stress in the work and life

- To find the reasons and effects of QWL of an individual.

- To build ways to smartens the progression of responsibilities of each.

- To increase the level of productivity and efficiency of an employee.

- To analyze the company's part in sharpening the quality of work life among engaged employees.

RESEARCH METHODOLOGY

Research Design: Research design adopted for the present study was descriptive research. The major purpose of this research is the state of affairs, as it exists as of now. Descriptive research design is concerned with describing the characteristics of a particular individual or a group

Data Collection: The present study was based on primary data, which was collected through structured questionnaire from various Logistics Companies, Sriperumbudur.

Sample Size: The sample size collected for the present study was 50.

Sampling Method: The Cluster Sampling technique was used to collect sample by selecting groups of sampling units from a population for analysis with the use of a random number table[6]. In cluster sampling, the population is broken into groups and a random sample is selected from all clusters.

Statistical Tools: The samples collected in the current study was analyzed through various statistical tools like Chi – square, Correlation , ANOVA etc.

DATA ANALYSIS AND INTERPRETATION

This chapter provides background on the technical aspects of the study and to the quality of information obtained. The data collected, as per the outlines provided under research methodology, is further analyzed and interpretation with the support of statistical tool like Chi-Square test ,ANOVA, Correlation etc.

CHI SQUARE TEST

1. Table showing age and experience sharing to help each other

Ho: There is no significance associated with Age and sharing experiences to help each other

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.586a	8	.475
Likelihood Ratio	8.481	8	.388
Linear-by-Linear Association	2.389	1	.122
N of Valid Cases	50		

a. 10 cells (66.7%) have expected count less than 5. The minimum expected count is .08.

Conclusion: Acquiring from the test *p* value is 0.475, which is greater than 0.05.

H0 is accepted. Hence there are no significant associated between Age and sharing experiences to help each other.

2. Table showing experience and reward system in the organization

Ho: There is no significance associated with Experience and reward systems

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.227a	8	.055
Likelihood Ratio	15.702	8	.047
Linear-by-Linear Association	10.062	1	.002
N of Valid Cases	50		

a. 11 cells (73.3%) have expected count less than 5. The minimum expected count is 1.54.

Conclusion: Acquiring from the test *p* value is 0.55, which is greater than 0.05.

H0 is accepted. Hence there are no significant associated between Experiences and the reward systems in the organization.

ANOVA

3. Table showing experience and promotion

H0: There is no significant difference between experience and promotion

ANOVA
Experience

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	23.102	3	7.701	4.340	.009
Within Groups	81.618	46	1.774		
Total	104.720	49			

Conclusion: Acquiring from the test *p* value is 0.009, which is *less* than 0.05.

H1 is accepted. Hence there is significant associated between Experience and the chances of Promotion in the organization

4. Table showing experience and engaging employees in management decision

H0: There is no significant difference between experience and Employees in management decisions.

ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	28.861	3	9.620	5.834	.002
Within Groups	75.859	46	1.649		
Total	104.720	49			

Conclusion: Acquiring from the test *p* value is 0.002, which is *less* than 0.05.

H1 is accepted. Hence there is significant associated between Experience and Employees in management decisions.

5. Table showing relation between experience and freedom to decide

H0: There is no significant associated with Experience and Freedom to decide on their own work

Correlations

		Experience	Freedom with decisions
Experience	Pearson Correlation	1	.376**
	Sig. (2-tailed)		.007
	N	50	50
Freedom with decisions	Pearson Correlation	.376**	1
	Sig. (2-tailed)	.007	
	N	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

Conclusion: The correlation value is positive; *p* value 0.007 which is *LESS* than 0.05.

H1 is accepted.Hence there is significance associated with Experience and Freedom to decide on their own work.

6. Table showing correlation between experience and leave policy

H0: There is no significant associated with Experience and Leave policy.

Correlations

		Experience	Leave policy
Experience	Pearson Correlation	1	.466**
	Sig. (2-tailed)		.001
	N	50	50
Leave policy	Pearson Correlation	.466**	1
	Sig. (2-tailed)	.001	
	N	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

Conclusion: The correlation value is positive; *p* value 0.001 which is *LESS* than 0.05.

H1 is accepted. Hence there is significant associated with Experience and Leave policy.

FINDINGS

- Experience is the core category with the most important in the logistics company, here it goes as an asset privilege of holding their employees for a longer period which reflects on their success factor.

- Reflecting on the quality of work life, the respondents mostly stay neutrally recognized for their effective work in the organization.

- Key strength of Logistics company in India was the employee are highly satisfied with Medical facilities, Canteen, Transport and Leave policies.

- Career planning makes a cutting edge among the employees

- Quality of Work life, the organizational experience by an employee; here the relationship among each and their flow play good.

- Most of the respondents said that Celebrations are the stress busters

- Most of the logistics company fails to have on balanced work and life.

DISCUSSION OF THE STUDY

Experience is considered as the most important category in the logistics industry when compared to other sectors in the market. As higher experience person will be having more success factor when compared to employees with less experience. As logistics industry happening to be a still budding in India, effective quality of work life is not been reflected in their working style. Many logistics companies do not have the basic amenities like canteen, Medical facilities etc.

SUGGESTIONS

- Assets being their experienced employees, the organization go uneven with promotions as the respondents fear to click disagree and stay neutral.

- Motivational programs are taken a positive feedback but they do not go on a satisfactory feel when it reads Success recognition.

- Reward recognition is the better code to crack as a motivational hick-up, which could relate with the Quality of Work Life.

- Departmental works are an unfavourable manner which stands neutral, this can affect the industry in long run.

CONCLUSION

Quality of work life plays a significant role in Human Resources Management. Quality of Work Life intends to improve and use Human Resources effectively. Since Organization is wheeling a faster growth with just the right employees assigned to trigger their drive safe, having parallel their mission, vision and practice. Quality of Work-Life does deals with satisfying employees with

enigma of facilities and choosing to celebrate every occasion, not missing a single chance to party with the employees; reminding them the organization has a personal concern of security at work and life.

Ethical clearance: nil

Source of funding: Self

Conflict of Interest: nil

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Behavioral Intervention During Pregnancy for Preventing Abdominal Obesity and Pregnancy Complications in Indian Women: Study Protocol

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ABSTRACT

Objectives: Primary objective is to study the effect of diet counseling, exercise on obesity parameters (weight, BMI, waist circumference) when they are given individually as well as in combination in Indian pregnant women. Secondary objectives are to study the effect on pregnancy related complications.

Methodology: Sampling technique: Two stage sampling (Stage I- preference; Stage- II random). Sample size: 100 pregnant females. All pregnant women will be given written evidence based report in local language about the importance of diet, physical activity on pregnancy outcomes. After screening for eligibility, they will be categorized as willing for exercise or not willing. Interested ones will be further randomized in any of two groups (exercise with diet advice or only exercise) and non interested ones in any of three groups (control, diet advice, home exercise).

Outcome variables (Primary): Weight; BMI; waist circumference. (Secondary)- 11 pregnancy related complications.

Expected outcomes: Based on literature review, it is assumed that diet advice group; exercise group will be better than control group. Supervised exercise, with or without diet advice, will be superior to remaining three groups in terms of all outcome variables.

Trial is registered with Clinical Trial Registry India with CTRI No.: CTRI/2017/04/008322 and UTN-U1111-1191-4492.

Keywords: Pregnancy, Behavioral intervention, obesity

INTRODUCTION

Worldwide prevalence of obesity has nearly doubled during 1980-2008, with more tendencies towards women[1] with similar trends seen in Indian women of reproductive age[2,]. Major reason for obesity is physical inactivity in women.[3] Recent review shows overweight and obesity being associated with several maternal and fetal complications and Indians being at higher risk than their western counterparts[4]. Obesity during pregnancy may be due to reduced physical activity and increased consumption of energy dense foods[5]. In India, only 10% of women meet the physical activity recommendations given by American College of Obstetrics and Gynecology (ACOG) during pregnancy as opposed to 42% in USA[6].

A positive effect is seen with physical activity in controlling excessive gestational weight gain (GWG) and post-partum weight retention (PPWR) in pregnancy[7,] similarly on pregnancy complications too[8]. Based on this, ACOG has formulated exercise guidelines for pregnant women[9]. However, beliefs and practices faced by Indian pregnant women are entirely different from that of western population. They are not encouraged for

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any physical activity during this phase. Elders urge them to eat energy dense high calorie food mainly made of sugar and clarified butter (ghee). These kinds of cultural differences prevent to implement such guidelines in India.

To provide good pregnancy care for women government of India has launched the "Pradhan Mantri Surakshit Matritva Abhiyan" for providing free facilities to expecting women. Educating women about healthy and safe pregnancy is one of the main components of the mission. On the same lines, this intervention will be a public health awareness program targeting women by providing awareness about benefits of being physically active during pregnancy.

Similar lifestyle interventions were reported earlier but they had inconsistent results[8,10]. In addition, there is severe dearth of intervention research involving Indian women during pregnancy. Hence, in this paper, we describe the methods of the behavioral intervention in women, a randomized controlled trial of exercise and/or diet during pregnancy.

METHODOLOGY

Objectives: Primary- To study the effect of diet counseling & exercise when given individually & in combination on obesity parameters (weight, BMI, waist circumference) in pregnancy.

Secondary- To study effect on 11 pregnancy and delivery related complications.

Participants and setting: The trial will be conducted at GJUS&T on medical panel and referral hospital, catering to obstetrics and gynecology cases. The recruitment period for trial is 10-12 months. Inclusion criterion is pregnant women with singleton live pregnancy not less than 16 weeks of gestation, BMI of ≥ 18.5 kg/m^2, age ≥ 18 years and having an access to mobile phone. Exclusion criteria is, any prior pregnancy complication, multiple gestations and if declared unfit by gynecologist for trial. They will be screened for their similar physical activity levels by a standardized questionnaire. They will be assessed for their complete demographic and socioeconomic status too.

Behavioral Intervention: After taking their written consent at initial assessments women are categorized

in two main groups, those willing for exercise, and not willing for exercises. Further, those willing will be randomized in any of two exercise groups of with and without diet advice. Similarly, those not willing will be randomized in one of two groups as control (receiving standard care) and only diet advice. Those women who are willing for exercises but could not come for exercises due to one or other reasons will form home exercise group.

The control group will receive standard regular consultations with the gynecologist and advised once at recruitment for diet care and exercises. Diet groups will receive regular messages during pregnancy for taking adequate healthy diet. These messages are formulated by study gynecologist and a dietician. Home exercise group will be taught exercises for home by study physiotherapist taking antenatal exercise sessions. They are advised to exercise cautiously and stop immediately if any warning signs are seen during the exercises[9]. They are free to ask about the exercises on their regular antenatal visits if they forget any.

The exercise groups are advised to walk daily for 30 minutes throughout pregnancy and attend weekly exercise classes from 20-26 weeks until 36 weeks of gestation. The behavioral principles in social learning theory are used to promote changes in eating and physical activity. It is an evidence-based approach, which is culturally and linguistically, accepted focusing on individual targets. The intervention follows the exercise recommendations of ACOG[13]. It is one hour weekly session starting with meditation followed by light warm up exercises in form of light aerobics, breathing exercises, stretching exercises for all muscle groups, pelvic floor and kegals exercises, abdominal and back care routine, endurance & strengthening exercises with resistance tubes. Exercises on Swiss ball as per the stage of pregnancy will also be practiced. Class ends with relaxation techniques including meditation. Towards final gestation weeks, more whole body workout will be included such as squats, lunges, duck walk, two belly dance sessions to keep up the interest and compliance of participants. In addition, the final sessions will include post-delivery posture care, breast-feeding, & baby care training sessions. These sessions are held twice weekly in hospital. Both morning and evening sessions are kept for having a good compliance and providing convenient time options for participants. The intensity of exercise

sessions will be moderate and kept patient specific. To prevent over exertion they will be asked to use the Borg scale of Perceived exertion (RPE) while doing any physical activity. There is evidence for the efficacy of this approach as when exercise is self-paced, most pregnant women will voluntarily reduce their exercise intensity as pregnancy progresses[9]. A trained physiotherapist certified in providing pre and postnatal care will provide all antenatal exercise sessions.

Women in intervention group are asked to do a regular cumulative walking of about 30 minutes daily throughout pregnancy during initial recruitment itself. This component of walking is emphasized the most for all women in intervention group. The pace should be such that the women should be able to continue any conversation without getting breathless or stopping the conversation in between, ACOG guidelines describes it as '*talk test*' another way to measure exertion.[11]

They are also advised to do these exercises at home at least twice a week. In most pregnancies, starting a moderate exercise routine is recommended and is found to be safe for both mother and the fetus[12]. Exercise training is patient specific with the aim of pushing the women beyond their individual pre-pregnancy activity levels and are more culturally acceptable, condition specific, having high reach and low cost such as daily household chores of mopping and floor sitting in third trimester are encouraged for having more compliance to the exercise routine and better home exercise adherence.

Primary Outcome variables: These outcome variables are the abdominal obesity measured as waist circumference, at the level of umbilicus; hip circumference measured at widest portion of buttocks. GWG measured as difference between the self-reported pre-pregnancy weight and weight just before delivery. Studies have shown good validity of self-reported pre-pregnancy weight if collected early in pregnancy[8]. PPWR is the difference in weight at two months post delivery and pre pregnancy weight. Height and BMI are measured as per standard procedures.

Secondary outcome variables: These variables are the pregnancy, delivery, & fetal complications such as gestational diabetes, gestational hypertension, preclampsia, cesarean section, post-partum hemorrage, induction of labor, microsomia, macrosomia, preterm birth, NICU admission, and perinatal death. These will

be noted from the patient after delivery and correlated with the hospital delivery records.

All women will be assessed for outcome variables three times: baseline (12-16 weeks of pregnancy), and again near term of pregnancy week 37 (range 36- 38), as well at two months post-partum

Ethical Considerations: Institutional Ethical Committee has approved the study vide letter no PTY/2016/555 dated 14[th]October 2016. It will be conducted in accordance with ICMR 2006 guidelines.[13]

Statistical Methods: The principal analysis will be done on an intention-to treat basis; outcome measures will be analyzed according to the treatment arm to which patients are randomized regardless of subsequent crossover or no adherence.

DISCUSSION

The epidemic of obesity is increasing in India with more number of women affected than men[14, 15]. Similarly maternal obesity is also associated with many pregnancy complications[16,17]. It is reported that excessive GWG is associated with long-term maternal abdominal adiposity hence making her susceptible for various metabolic diseases[18]. A study have shown majority of Indians are less active with less than 10% engaging in any kind of recreational physical activity[3]. Pregnancy adds to this view, as it is a traditional belief that a pregnant woman should not be exercising and should eat for two during pregnancy. This phase of inactivity with added calorie rich diet is eventually adding to the recent spike in obesity epidemic in India especially in women. Also women are more centrally obese i.e. they have more abdominal obesity as compared to men[19]. It is reported that waist circumference is a better marker of obesity-related metabolic risk than BMI in Indian women[19,20]. Heart Outcomes Prevention Evaluation (HOPE) study reported that abdominal adiposity worsens the prognosis of patients with cardiovascular disease[21]. This recent emergence of various lifestyle diseases could be a result of decreased physical activity levels amongst Indians. However, there is growing problem of central obesity in Indian women, but there are hardly any intervention trials focusing on abdominal obesity in pregnant women. Pregnancy is seen as a unique time in any women's life when she is more willing for a behavioral change

in her lifestyle[22], hence a trial with physical activity in pregnancy is proposed. In present study, we aim to prevent central obesity, excess postpartum weight gain and pregnancy or delivery complications through a behavioral intervention throughout pregnancy.

The biggest strength of this intervention is that it is a first behavioral intervention in state of Haryana that is focusing on women health by encouraging them for being more physically active and aims to control the central obesity of pregnant women. Another positivity of this trial is women were not forced to be a part of trail, but were randomized into exercise and non-exercise groups after they express their willingness for the same or not. Randomization at first step itself could be inappropriate as success of trial depends on willingness of the subject to change and nothing can be forced upon. If due to randomization, a subject willing for exercises during pregnancy is kept in control group or vice versa then it will be ethically wrong. As we cannot deny such facilities if the patient wants to learn and at the same time cannot force anybody to do exercise just because of randomization they are put in certain exercise group. Participants who would like to be physically active during pregnancy would be active irrespective of the groups they are kept in due to randomization. Similarly, those who are not motivated for physical activity would not like to attend exercise sessions. By doing that, there would be high chances of contamination of groups and could result in low compliance and high dropout rates during the trial. Also to best of our knowledge there are no published intervention trials which include the effect of diet and exercise alone and in combination with standard care on pregnancy outcomes and abdominal obesity in pregnant women that enter into the post-partum period.

Haryana is one of the richest states in India, the possible challenge for this trial could be that it is planned in a place where putting on weight is seen as a sign of prosperity. Doing any kind of exercise or physical activity during pregnancy is an alien thought for majority of people living here. Haryana state, like India as a whole, is largely a patriarchal society. Women largely depend on the permission of the elderly family members for making important decisions that includes the choice of treatment during pregnancy, so the success of this trial depends on support of the family. Thus, it will be a herculean task to motivate the family members along with the participant

for attending supervised exercise classes. It could result in low number of participants opting and complying for supervised exercise intervention. Earlier pregnancy intervention studies have shown similar difficulties in recruitment of pregnant subjects finally leading to relaxing their selection criteria or reducing the sample size finally stopping data collection and analyzing with the available participants[15].

CONCLUSION

We hypothesize that women who remain physically active during pregnancy in any form as well as follow proper balanced diet will be less centrally obese and have reduced GWG and PPWR as compared to those who are not physically active. They will also have reduced delivery complications.

Conflict of interest: Authors declare that there is no conflict of interest of any kind.

Source of funding: Self

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Comparative Study of Aspiration and Non Aspiration Techniques in Diagnosis of Thyroid Lesions

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ABSTRACT

Aims: The study was designed to compare the material adequacy on fine needle aspiration & fine needle non-aspiration cytological techniques in thyroid lesions and histopathological correlation of the diagnosis, wherever possible.

Methods and Material: A total of 120 cases of thyroid lesions were included in this study. The patients were subjected to both FNAC and non aspiration. Smears were grouped as adequate and inadequate according to Bethesda system of cytological reporting of thyroid.

Results: In this study, the majority of the patients were aged between 30 and 39 years with a mean age of 38.56 years. In this study, females comprised 87.5% of the study group, while males comprised only 12.5%. Female to male ratio came out 7:1. Sixty six out of 120 patients, constituted 55% of the total showed adequate cellularity in Fine needle aspiration cytology technique. Ninety out of 120 patients showed adequate cellularity with non aspiration technique constituting 75%.

Colloid goiter was the commonest lesion among non neoplastic category while follicular neoplasm in the neoplastic category. Cytological findings were confirmed by histopathological analysis in 30 cases. On statistical analysis, sensitivity was 83.33% while specificity came out 95.83%.

Conclusions: Non aspiration technique for sampling thyroid lesions is a useful tool for making a correct diagnosis in the majority of cases based on clinicocytological correlation. Non aspiration technique is a sensitive, specific, accurate, rapid, minimally invasive and cost effective with more number of adequate samples.

Keywords: Cytology, FNAC, Non aspiration, thyroid.

INTRODUCTION

Thyroid nodules are the most common endocrine disorder particularly in countries where dietary iodine intake is low.[1] India has the world's biggest "Goitre Belt" in the Sub-Himalayan region where the prevalence may be as high as 40%. Besides the Sub-Himalayan region, many other regions in India are endemic for goitre.[2] Thyroid enlargement, whether nodular (solitary or multiple) or diffuse requires a battery of investigations like history, physical examination, thyroid hormonal assay (T3, T4, TSH), immunoassay, transcutaneous ultrasonography, scintiography with I123 or Tc99m pertechnetate and fine needle aspiration cytology (FNAC) but FNAC has surpassed most of the other tests.[3]

The traditional or conventional technique of FNAC based on the observation that capillary pressure in fine needle is sufficient to keep the scraped cells inside the lumen. Zajdela, Zillhardt, Voillemot[4] obtained cytological samples by using a fine needle without aspiration called Fine needle capillary sampling (FNCS) or Non aspiration (NA) cytology. Advantage of non aspiration technique is that admixture with blood is less than with aspiration.

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Present study was done to compare aspiration and non aspiration technique in diagnosis of thyroid lesions.

MATERIALS AND METHOD

Firstly the clearance from the institutional rthical committee was obtained. The procedure was explained to the patient and consent was obtained prior the procedure. The patients were subjected to FNAC and non aspiration using 23-gauge needles and 10-cc plastic syringes. All the procedures were performed by a single operator. Every slide was assessed without the prior knowledge of techniques utilized. The study was thus single blind and also prevented the observer bias. Histopathological examination was done wherever possible. Smears were grouped as adequate and inadequate according to Bethesda system of cytological reporting of thyroid.i.e. Presence of at least 6 groups of well-preserved, well-visualised follicular cells, each group consisting at least 10 cells, preferably on a single slide.

Air dried smears were processed for MGG (May Grunwald Giemsa).Wet smears fixed in isopropyl alcohol or ethyl alcohol and ether in equal parts was processed for PAP staining. H & E stain was used for histopathology study.

FINDINGS

A total of 120 cases of thyroid lesions were studied. The majority of the patients were aged between 30 and 39 years with a mean age of 38.56. In this study, females comprised 87.5% of the study group, while males comprised only 12.5%. Female to male ratio came out 7:1. Thirty seven cases (30.83%) belonged to age group of 30-39 years, followed by 23 (19.17%) cases in age group of 40-49 years, age group of 50-59 years had 19 cases (15.84%), 15 cases (12.5%) in 60-69 years, 13 cases (10.83%) in 10-19 year.

Ninety out of 120 patients showed adequate cellularity with non aspiration technique constituting 75%. Sixty six out of 120 patients (55%) showed adequate cellularity in fine needle aspiration cytology technique.

106 out of 120 patients in present study fall in non-neoplastic category constituting 88% of total cases and the remaining 14 cases (12%) were neoplastic.

Non neoplastic category comprised of cases of colloid goitre (n=82); thyroiditis (n=20); hyperplasia(n=4). On aspiration out of 82 cases of colloid goiter(IMAGE 1,

2). Histopathological examination was possible in 24 cases which 23 were consistent while one case was false negative which was reported as papillary carcinoma.

Four cases of hyperplasia of thyroid were diagnosed. (IMAGE 3) Twenty cases of thyroiditis were diagnosed. (IMAGE 4)

Neoplastic category comprised of cases of follicular neoplasm(n=6); papillar carcinoma (n=4); medullary carcinoma(n=2) and anaplastic carcinoma(n=2).

In six cases of follicular neoplasm (IMAGE 5), four cases were available for histopathological examination in which 3 came out as follicular adenoma and one was false positive which came out as nodular colloid goiter.

Four cases of papillary carcinoma thyroid (IMAGE 6), two histopathological cases were consistent with it.

In present study, the sensitivity was 83.33% while specificity came out 95.83%.
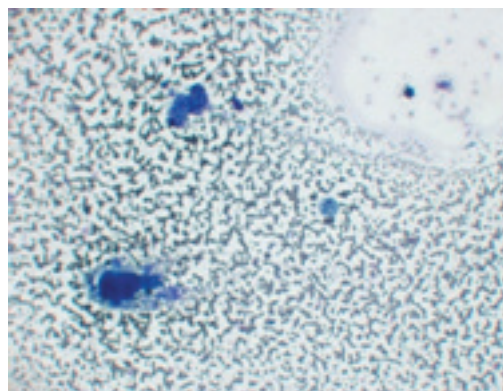
IMAGE 1
Nodular colloid goiter showing groups of thyroid follicular cells along with thick colloid (MGG X100)
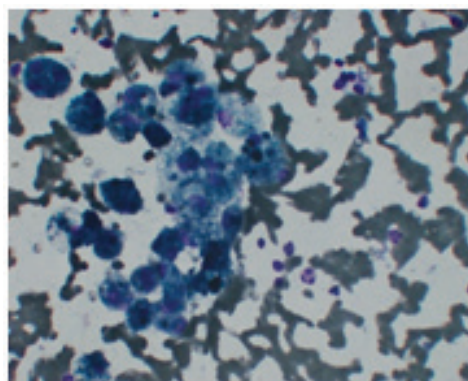
IMAGE 2
Nodular colloid goiter with cystic changes showing pigment laden macrophages (MGG X 400)
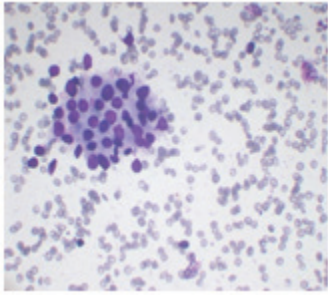
IMAGE 3
Primary hyperplasia showing 'fire flares' around hyperplastic follicular cells. (MGG X 100)
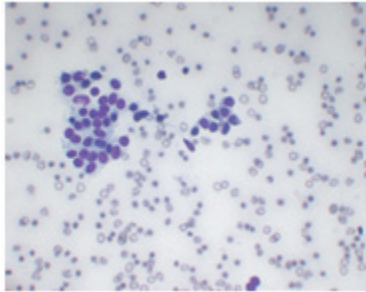
IMAGE 4
Lymphocytic thyroiditis showing mixed lymphoid cells along with follicular cells (MGG X 400)
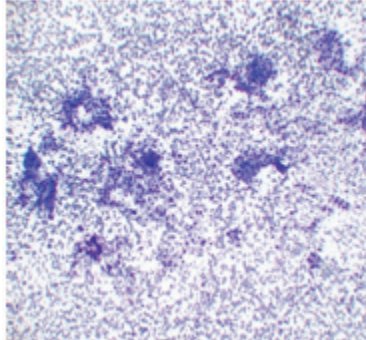
IMAGE 5
Follicular neoplasm showing microfollicles (MGG X 100)
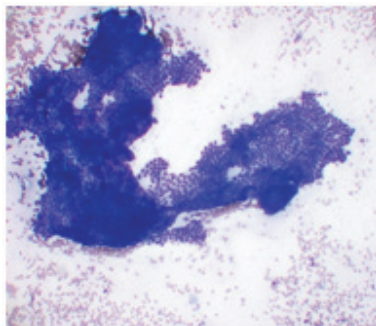
IMAGE 6
Papillar carcinoma thyroid showing finger like papillae (MGG X 100)

DISCUSSION

In present study females were found to be affected more than males in thyroid disorders. Female to male ratio was 7:1. Same was found by Hamburger[5] who observed female: male ratio 8:1 among his 246 patients. Hawkins et al in 1987 found ratio of 9:1 among total number of 1399 patients.

In the present study, thyroiditis was more common than the neoplastic lesions. Khan et al[6] showed thyroiditis to be more common than the neoplastic lesions as is in the present study while on the contrary, Yeah[7] showed neoplastic lesions to be more common than the thyroiditis. Colloid goiter was the commonest lesion among non neoplastic category while follicular neoplasm in the neoplastic category in the present study. Bhatta, Makaju, Mohammad[8] studied 90 patients with thyroid lesions. The FNAC results revealed 77 cases (85.55%) as non neoplastic and 13 cases (14.45%) as neoplastic.[8] Commonest lesion in thyroid was colloid goiter which is consistent with the present study.

In present study non aspiration yielded adequate specimen in thyroid lesions in more number of cases (75%) as compared to aspiration (55%). Inadequate cases by non aspiration were 25% while on aspiration it was more (45%). This is consistent with the study of Krishnappa[9] who obtained diagnostically less adequate samples by aspiration technique in comparison to non aspiration technique. He observed that the percentage of inadequate sampling was more with aspiration (31.25%) than with non aspiration (20.9%) technique.[9] Kate et al[10] also observed non aspiration to be yielding diagnostically superior results or text book like material. This was mainly because of the fact that dilution of cellular material with blood is the main cause of more number of inadequate smears by FNAC. This is minimal with non aspiration cytology because of spontaneous ascent of material by capillary action and significant reduction in trauma to the lesion and surrounding tissue. A large number of workers also observed that non aspiration technique had a better yield than fine needle aspiration as was also observed in the present study.[11,12,13]

Sharma M et al[14] favoured non aspiration technique over conventional FNAC as non aspiration technique had less background blood, and better quality of cellular material and better retention of architecture. Song et al [15] compared the quality of smears collected by FNAC and FNNAC and found that a larger number of samples collected by non aspiration technique were better

than conventional FNAC technique but there was no statistically significant difference in quality of smears obtained by non aspiration and aspiration techniques.

On correlating the cytological diagnosis with histopathological diaganosis, the cytological techniques showed sensitivity of 83.33% while specificity came out to be 95.83%. Bhatta, Makaju, Mohammad study sensitivity was 85.7% and specificity 92.3% which is consistent with the present study.[8] Bakhos et al in 2000 evaluated the accuracy of thyroid FNAC and causes of cytohistopathological discordance. The review revealed 93% sensitivity and 96% specificity for FNAC diagnosis.

CONCLUSION

The study confirmed that Non aspiration or FNAC of thyroid nodule can be performed with high sensitivity and specificity by experienced clinician or pathologist.[16]

Conflict of interest: none

Source of Funding: self

Ethical clearance: clearance obtained from institutional ethical committee.

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Compliance to Disclosure Norms in the Hospitals of Delhi

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ABSTRACT

Medical science has witnessed multiple, wanton, intentional and unintentional negligence by practitioners and health care providers, resulting in patient harm. While, many factors contribute to Medical malpractice at various levels; this study is focused on failures around some of the commonest and easily identifiable malpractices, such as displaying important documents and instructions for the benefit of service users, elaborated under the "Disclosure Requirements". The intent is to generate evidence that failure to comply with legal requirements in medical practice is ubiquitous. In a country where simplest of the simple legal requirements are not complied with, non-compliance to the critical ones that have larger and deeper consequences is but obvious! For instance, the Delhi Nursing Homes Registration Act,1953 and MCI Code of Ethics Regulations, 2002 mandates hospitals to display their Registration certificates, Rates and charges of the treatments, Consultation fees and Doctors' qualification conspicuously in the hospital premises. Therefore, the purpose of this study was to assess compliance to this simple requirement under law, which expects the hospitals in Delhi, India comply to the Disclosure norms.

Methods: An observational study of 100 Hospitals was conducted, using a purposive sampling to be able to cover different kinds of facilities to study the compliance to aforementioned Disclosure rule.

Results: Out of the 100 hospitals that were surveyed, none of them fully complied to the requirements of the Disclosure norms. When it came to displaying the Registration Certificates, the Public Hospitals were the main defaulters. 47 out of the 72 Private Hospitals that we resurveyed displayed the qualifications of their doctors.

Conclusion: Both private and public hospitals were found to be violating the legal requirements. There is need to build a stronger mechanism for enforcing law and ensuring compliance to the legal requirements to curtail medical mal practice, which has become a norm in the medical practice today.

Keywords: *Disclosure norms, Registration Certificates, Doctors Qualification, Nursing Homes Registration Act, MCI Code of Ethics Regulations.*

INTRODUCTION

Medical science has witnessed multiple, wanton, intentional and unintentional negligence by practitioners and health care providers, resulting in patient harm. While, many factors contribute to Medical malpractice at various levels; this study is focused on failures around some of the commonest and easily identifiable malpractices, such as displaying important documents and instructions for the benefit of service users, elaborated under the "Disclosure Requirements". The intent is to generate evidence that failure to comply with legal requirements in medical practice is ubiquitous. In a country where simplest of the simple legal requirements are not complied with, non-compliance to the critical ones that have larger and deeper consequences is but obvious! For instance, the Delhi Nursing Homes Registration Act, 1953[1] and MCI Code of Ethics Regulations, 2002[2] mandates hospitals to display their Registration certificates, Rates and charges of the treatments, Consultation fees and Doctors' qualification conspicuously in the hospital premises.

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Therefore the purpose of this study was to assess compliance to this simple requirement under law, which expects the hospitals in Delhi, India comply to the Disclosure norms.

REVIEW OF LITERATURE

Disclosure norms are a set of principles which govern the conspicuous display of various certificates, licenses, doctors' qualifications, rates and charges of various treatments and consultation fees in the premises of a hospital, nursing home, and clinics [3] to appropriately and adequately inform the users of the service/s. These norms are applicable not only in India but in other countries as well, like United States of America, [4] [5] United Kingdom, Canada, [6] [7] Singapore and others. These norms are significant to inform patients and public at large.

For instance, the Registration Certificate display as governed under the Clinical Establishment Act, 2010[8] or the Nursing Home Act intimates the public that the facility has legally valid license to operate the facility; thereby assuring the users to certain basic set of quality, as the law expects compliance to Standard Operating Procedures laid under this law for obtaining the registration by concerned authorities during the period of its validity.

Similarly, to practice medicine, a doctor is required to complete his/her requisite medical education and possess necessary qualification. For an allopathic doctor, he is required to have a MBBS degree, whereas for a dentists/he should have a BDS degree. MCI code of Ethics further expects that the practicing physician should register themselves with the respective state medical councils. Subsequently, s/he needs to make sure that s/he displays the registration certificate in his place of work as well as s/he needs to display his qualifications alongside his name on the name plate outside his/her chamber. This is essential for the patients to choose appropriate doctor for a particular ailment.

Thirdly, physicians has to clearly display [9] his fees and other charges [10] on the board of his chamber and/or the hospitals he is visiting. Prescription should also make it clear, if the Physician himself dispensed any medicine. A physician shall write his name and designation in full along with registration particulars in his prescription letter head.

Aim: The aim of the study was to collect evidence around the extent of compliance of the hospitals in Delhi to the Disclosure.

Objectives

1. Undertake the field study of hospitals for compliance to rules on disclosure that have not been addressed effectively through the existing regulation.

2. Understand more through secondary data study.

3. Define the way-forward.

Approach and Methodology: We undertook an observational study of 100 Hospitals, using a purposive sampling to be able to cover different kinds of facilities to study the compliance to aforementioned rule. The following are the different categories of facilities for observational study of the premises.

A. PUBLIC HOSPITALS

   i. DELHI GOVERNMENT HOSPITALS

   ii. MCD HOSPITALS

   iii. NDMC HOSPITALS

B. PRIVATE HOSPITALS

   i. NOT FOR-PROFIT HOSPITALS

   ii. FOR-PROFIT HOSPITALS

Research Approach: A direct observational study method was adopted to validate the compliance. The areas examined under the study included the assessment of status of compliance to the following:

1. Hospital conspicuously displaying their registration Certificates or not?

2. Hospital displaying the qualifications of their doctors publicly or not?

3. Hospital displays the rates/charges for their various services publicly or not?

4. Hospitals display the fees/consultation charges of the doctors publicly or not?

Collection of Data: Purposive sampling method was used to sample out are representative set of hospitals to cover different categories and type of hospitals under the Delhi Govt.

- The study started with drawing a list of registered private hospitals in Delhi and all the public hospitals in Delhi from the Government of Delhi website (www.delhi.gov.in).

- These hospitals were segregated on the basis of the region they fall in so as to cover the whole area of Delhi. So Delhi was divided into 5 regions (North, South, East, West and Centre).

- This was done using an application "Batch Geo" to locate the hospitals in different regions of Delhi.

- Using the 95% confidence interval level, a sample size of 93 hospitals were drawn but to make the sample statistically more representative the number was increased to 100 hospitals.

- The sample size of 100 hospitals were chosen to represent a population of 986 hospitals in Delhi for the field research.

Table 1: Total number of hospitals in Delhi

Number of Hospitals	North	West	East	South	Central	Total
Private	274	306	113	183	57	933
Delhi Government	10	11	8	3	6	38
MCD	6	1	2	2	2	13
NDMC	0	0	0	1	1	2
Grand Total						986

- Now using R software the 100 hospitals were randomly selected from all 5 regions.

- These hospitals were selected in proportion of the total number of hospitals in each region.

Table 2: Sample Hospitals for Field Survey

Sample	North	West	East	South	Central	Total
Private	21	24	9	13	5	72
Delhi Government	4	5	3	3	3	18
MCD	3	0	2	1	2	8
NDMC	0	0	0	1	1	2
Grand Total						100

- Then we started with the field survey and visited these 100 hospitals to see if they comply with the above mentioned questions.

- The data was collected, collated and analyzed to know whether the hospitals comply with Disclosure norms or not.

Inclusion and Exclusion Criteria: Data was collected from both Public as well as Private hospitals only in Delhi.

The National Capital Territory that includes Noida and Gurgaon were excluded from the study.

The hospitals under central institutions like All India Institution of Medical Sciences, Armed forces Hospitals, Employee State Insurance hospitals under Ministry of Labour among others are also excluded from the study.

FINDINGS & ANALYSIS

The data was collated and analyzed using Microsoft Excel and R Software, and the findings are as follows:

The findings of the disclosure rule study were collated in a tabular form as shown below along with their explanations:

Table 3: Data Analysis Table

Hospitals	Number of Hospitals	Sample size	Registration certificate displayed (figures in bracket are in %)	Doctors' qualification displayed (figures in bracket are in %)	Rates and charges displayed (figures in bracket are in %)	Fees displayed (figures in bracket are in %)
Public	**49**	**28**	**0 (0)**	**5 (17.9)**	**11 (39.3)**	**7 (25)**
Delhi Govt	38	18	0 (0)	4 (22.2)	8 (44.4)	5 (27.8)
MCD	11	8	0 (0)	1 (12.5)	2 (25)	1 (12.5)
NDMC	2	2	0 (0)	0 (0)	1 (50)	1 (50)
Private	**933**	**72**	**55 (76.4)**	**47 (65.3)**	**30 (41.7)**	**13 (18.1)**
Not For-Profit	43	9	7 (77.8)	6 (66.7)	4 (44.4)	1 (11.1)
For-Profit	890	63	48 (76.2)	41 (65.1)	26 (41.3)	12 (19.1)

NOTE: Number of hospitals & Sample size chosen for the study are given in the first two columns of Table-3

1. Display of Registration Certificate(as given in Table-3):

- We could not find any registration certificate on display for public hospitals. That is why the figures in the registration column for public hospitals are Nil.

- On the other hand, 55 private hospitals out of 72 displayed their registration certificate.
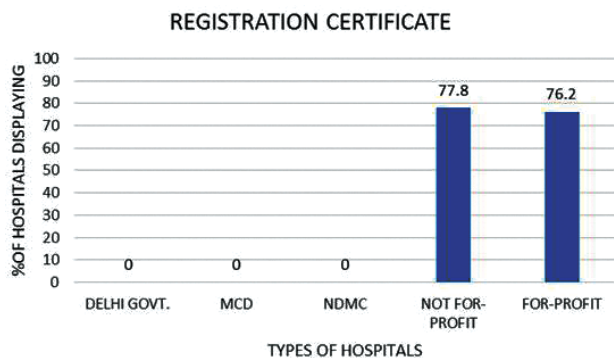
Figure 1: Display of Registration Certificate Graph

None of the Delhi govt. Hospitals, MCD Hospitals and NDMC Hospitals displayed their registration certificate. Whereas, 77.8% of Not For-Profit and 76.2% of For-Profit Hospitals displayed it.

Presumably the private hospitals are complying with this regulation in order to generate people's confidence, whereas the public hospitals don't feel any reason to comply with these regulations in spite of the fact that they are the run by government itself.

2. Display of Doctors' Qualification:

- 5 Public hospitals out of 28 that we visited displayed the qualification of their staff.

- 47 out of 72 private hospitals made sure that they display the doctors' qualification for the public at large.
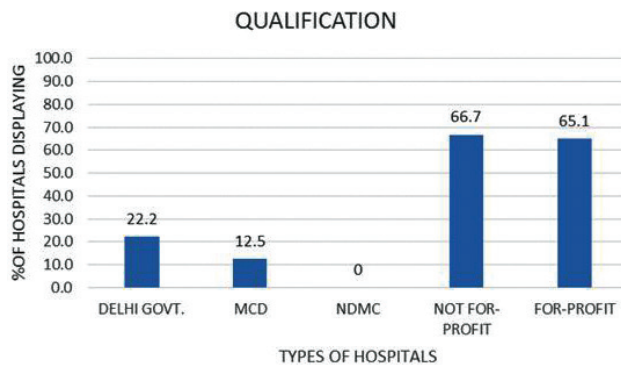
Figure 2: Display of Doctors' Qualification Graph

None of the hospitals; private or public, are fully compliant to the display of doctors' qualification. Private hospitals, in some cases have displayed the qualification to some extent whereas the Public hospitals are the major violators of this regulation.

Amongst Delhi govt. Hospitals only 22.2% display the qualification of their doctors, whereas 12.5% of MCD Hospitals, 66.7% of Not For-Profit Hospitals and 65.1% of For-Profit Hospitals display doctors' qualification.

As a matter of surprise, none of the NDMC Hospitals display doctors' qualification, and a few which partially displayed doctors' qualification.

3. Display of Rates and Charges:

- To help patients know the rates and charges for different treatments, the hospitals need to display it conspicuously.

- In this case 11 public Hospitals out of 28 and 30 Private hospitals out of 72 made sure they have the rate list on display.
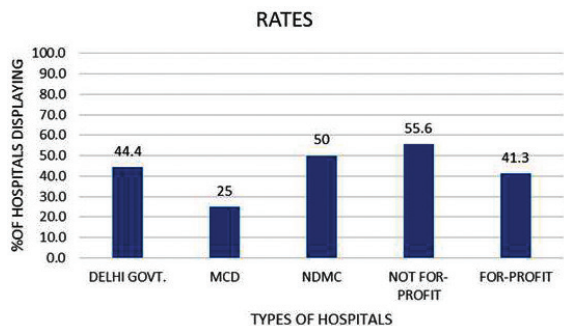
Figure 3: Display of Rates/Charges Graph

In terms of display of rates, all the hospitals were by far sub optimally compliant to the requirements of the regulation.

Amongst Delhi govt. hospitals about 44.4% display rates whereas, in MCD hospitals only 25% have rates list. In NDMC Hospitals the proportion is 50% whereas in Not For-Profit Hospitals and in For-Profit Hospitals it is 55.6% and 41.3% respectively.

There are few For-Profit hospitals where these rates are partially displayed.

4. Display of Consultation Fees:

- Very few hospitals, i.e. only 7 Public out of 28 and 13 Private out of 72 Hospitals displayed their consultation fee-charges.
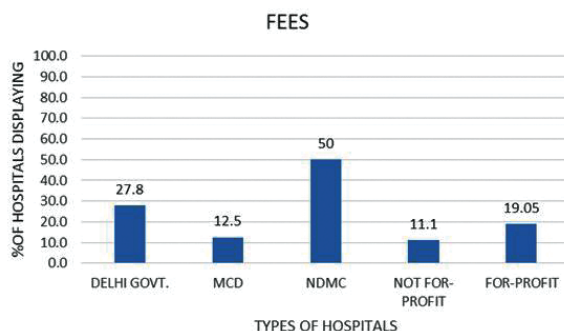
Figure 4: Display of Consultation Fees Graph

Talking of the display of consultation fees, all the hospitals were by far non-compliant to the requirements of the regulation. The findings were skewed because we had only 2 hospitals in the NDMC category.

Amongst the Delhi govt. hospitals 27.8% display the fee list whereas, 12.5% of MCD hospitals have this list. In For-Profit hospitals this proportion goes down to 19.05% and in Not For-Profit Hospitals it goes down further to 11.1%. In NDMC Hospitals this proportion is 50 %.(Only 2 NDMC hospitals are there)

RESULTS

- Public hospitals did not display their registration certificates.

- None of the hospitals (private and public) were fully compliant to the display of doctors' qualification. The Private hospitals displayed the qualification to some extent. Whereas the Public hospitals were the major violators of this regulation.

- Public hospitals and private hospitals were equal defaulters in displaying rates/charges. However, Corporation hospitals came across as the worst with 25% of them displaying.

- Doctors' fees/consultation charges were opaque and rarely displayed publicly. There was no uniformity in displaying the consultation fee.

DISCUSSION AND ANALYSIS

This study is a shift towards making the consumers aware & empowers them to make informed choices.

1. The compliance of the private (for profit and not-for-profit) hospitals to disclosure of registration certificate and doctor's qualification were much better than the public sector. This can be attributed to the fact that public disclosure of registration certificate and doctor's qualification is a significant tool to generate people confidence. Therefore, the private hospitals want to communicate to the masses that they are legally authorized entities of the government and have highly skilled staff to take care of their health issues.

2. The Delhi Nursing Home Act is not applicable to the public hospitals therefore they don't disclose

any certificate towards this effect. However, it's not clear as to why it's not applicable to public hospitals, as public hospitals are equally responsible to assure the masses the level of care offered within their premises. It is not possible that all public hospitals offer same level of care and services in all its hospitals.

3. However, as per Right to Information Act, and the Indian Public Health Standards expects the public hospitals to disclose details around their services provision, rate cards of services charged, and doctor's qualification for the benefit of people. Therefore, we witness some level of compliance to these requirements. The level of compliance in both public and private hospitals in the mentioned areas has by and large remained the same.

4. However, compliance to disclosure around consultation fee in private hospitals has been relatively lower than the public hospitals.

CONCLUSION

From these findings it can be safely concluded that irrespective of the ownership of the hospital, the compliance to the "Disclosure Norms" in the hospitals of Delhi has been low. Meaning, disclosure is not yet a practice in the hospitals of Delhi that is meant for communicating to the service users.

Those who comply with some of the requirements do so probably because of fear for punishment/ disciplinary action (public hospitals) or enticing/garnering patient confidence (private hospitals).This forces us to think and act on some critical issues:

1. Making a law is not enough.

2. It is important to create adequate incentives and disincentive mechanisms to ensure compliance.

3. Law enforcement through regular monitoring mechanism is critical to sustain compliance, before it becomes a practice or a norm.

RECOMMENDATIONS

Therefore, we recommend that in order to ensure compliance to the laid down rules and regulations in both letter and spirit:

- The regulator should build in systems to enforce compliance to the law.

- The hospitals irrespective of their ownership (Private or Public) should be mandated under law to register themselves with the appropriate authority to assure public of select set of services.

- They should display their Registration Certificate conspicuously to the information of public at large.

- Doctors' qualification should be displayed mandatorily so as to curb quackery from the practice of medicine in a specialized stream (Allopath, Homeopathy).

- Display of Rates and Fees of doctors will help the out of pocket payers in deciding from where they would like to receive the treatment by comparing cost/experiences.

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Knowledge among Mothers' of Children and Youth with Hemophilia–A Cross Sectional Survey at a Hemophilia Center

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ABSTRACT

Introduction: Hemophilia is a genetic disease caused by deficiency of factor VIII or IX. Awareness about the disease condition among parents and children also is as important to manage the disease effectively.

Objectives: To assess the knowledge on hemophilia among mothers' of children with hemophilia and youth with hemophilia.

Methodology: A cross sectional survey was conducted at hemophilia center(Manipal, Karnataka). In total, 23 mothers' of children and 27 youth with moderate and severe hemophilia were included. The participants were selected based on purposive sampling. Approval was taken from the ethical committee. Demographic proforma and knowledge questionnaire was used to collect the data. The data was analyzed using SPSS 16.0 version.

Results: The mean age of the participants were 13.68 years. Out of 50 participants 42 had moderate and 8 had severe hemophilia. Moderate knowledge was found among 43.5% of mothers' and 66.7% of youth with hemophilia.

Conclusion: This study shows that mothers' knowledge on hemophilia is limited and highlights the importance of continual education of parents and youth about their disease.

Keywords: Hemophilia, Children and youth, knowledge

INTRODUCTION

Hemophilia is an inherited X-linked coagulation disorder caused by deficiencies of the clotting factor VIII (FVIII: hemophilia A) or factor IX (FIX: hemophilia B). Hemophilia occurs in approximately 1 in 10,000 live births.[1,2] Hemophilia can be mild, moderate and severe in clinical severity based on percentage of factor levels. Spontaneous bleeds are more in moderate and severe hemophiliacs compared to people with mild hemophilia[3].

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A developing country like India has 10-80% of People with Hemophilia (PWH) when we compare with the global statistics[3]. As per the 2015 survey by World Federation of Hemophilia, only 17,346 PWH from India are diagnosed and registered.[2] Early identification and treatment of bleeds in hemophiliacs has shown to be of immense benefit in the overall clinical outcome[4]. But in a developing country like India there is little or no access to factor replacement therapy leading to greater mortality and morbidity[5]. Hemophilia being a chronic illness presents lifelong challenges to individuals affected[6]. Awareness about the disease also influences the compliance with treatment.

PWH receive on demand or prophylactic factor replacement therapy[7,8]. They require lifelong treatment and parents or caregivers need to know about the disease condition, treatment modalities, first aid for bleeds and

physiotherapy[9]. Mother plays an important role in caring children with hemophilia[10]. By the age of 12years the child takes more initiative and learns to manage many aspects, but sometimes they may not comply with exercise and treatment[11]. A Study by Nazzaro *et al.*, have shown that 60% of youth managed hemophilia by avoiding physical activity and 67% did not know the transmission routes for hepatitis B[12].

Novais *et al*. conducted a study on treatment related knowledge and skills of 80 patients with hemophilia and 55 caregivers showed that only 43.7% knew the effect of clotting factor concentrate on hemostasis process[13]. Lane S. *et al*. conducted focus group discussions among health care providers on what men with severe hemophilia should know about hemophilia and he reported that areas of knowledge required by men include types, severity, clinical features, bleed prevention and exercise[14]. This study was conducted to assess knowledge of mothers' of children and youth with hemophilia in one of the hemophilia centers of Karnataka, India.

MATERIALS AND METHODS

A cross sectional survey was conducted at the selected hemophilia center of a tertiary hospital of Udupi district. The researcher included two groups of participants in this study. Inclusion criteria for the first group was mother of a child (5 to 12years) with moderate or severe hemophilia, so if the child is below 12years the knowledge questionnaire was administered to mother. Second group is youth (13 to 24 years) with moderate or severe hemophilia and the knowledge questionnaire was filled by them.Purposive sampling was used to select the participants. Demographic proforma and knowledge questionnaire was used to collect the data.

The demographic proforma included baseline information of the child and disease like age, education, diagnosis, factor level, family history of hemophilia, hepatitis vaccination and physiotherapy. Knowledge on hemophilia was assesses by knowledge questionnaire which consisted of 30 multiple questions. The questions were mainly focused on areas of basics of coagulation, severity of hemophilia, clinical features, first aid measures, transfusion related problems, dental care, genetics, management of hemophilia and complications.

Content validity of the tools were established by taking suggestions from experts in the field of pediatric medicine, pediatric nursing and hematologist. Reliability of the knowledge tool was established by split half method (r=0.79). All the questionnaires were translated to local languages Kannada and Malayalam. The feasibility of the study was established by piloting on ten mothers.

Ethical considerations: Study protocol was approved by Institutional Ethics Committee (IEC) of Kasturba hospital Manipal. Participant information sheet was given to all participants. Informed consent was obtained from participants and assent from children. Confidentiality of the data was assured by the researcher.

Data collection procedure: After obtaining the written consent, data were collected from the participants during a summer camp 'ASHA KIRAN' conducted every year by Manipal Hemophilia Center. Questionnaire on demographic proforma and knowledge questionnaire were given to mothers if a child is below 12years. If the child is above 12years the tool was filled by themselves. They were instructed to answer all the questions by ticking a correct answer from four given options for knowledge questionnaire. Data were entered and analyzed using the software SPSS version 16.0.

RESULTS

Sample characteristics: A total of 23 mothers and 27 youths were interviewed to assess the knowledge on hemophilia.

Table 1: Demographic characteristics of participants (n=50)

Sample Characteristics	Frequency	Percentage
Age in years		
Children (6-12)	23	46
Youth (13-24)	27	54
Status of children		
Going to school	46	92
Left the school and at home	2	4
Employed	2	4
Education		
Primary school	24	48
Higher school	14	28
PUC	7	14
Degree	5	10

Out of 50, 46% were children and 54% were youth. The mean age of children was 8.79 years and the youth was 17.88 years. Majority of the children were going to school (46 out of 50), however two children left the school due joint problems. With regard to education it was found that majority were in the primary school.

Disease characteristics

Table 2: Disease and treatment characteristics of participants

(n=50)

Sample Characteristics	Frequency	Percentage
Type of haemophilia		
Hemophilia A	45	90
Hemophilia B	5	10
Severity of haemophilia		
Moderate	42	84
Severe	8	16
Family history		
Yes	28	56
No	22	44
Hepatitis vaccination		
Yes	39	78
No	11	22
Recording bleeds in a book		
Yes	11	22
No	39	78

In order to understand more about the participants' data were collected regarding hemophilia (Table 2). It was observed that majority were diagnosed with hemophilia A (90%).Out of 50 16% were suffering from severe hemophilia and 56% had family history of hemophilia. Majority of the participants (78%) received hepatitis vaccine. Only (22%) were recording joint bleeds in a book.

Demographic characteristics of the mothers: Out of 50 PWH 23 were below 12 years of age, so the knowledge questionnaire was administered to mothers to assess the knowledge about the disease of their children.

Table 3: Demographic characteristics of mothers' of children with hemophilia

(n=23)

Sample Characteristics	Frequency	Percentage
Age in years		
20-30	8	35
31-40	15	65
Education		
Primary education	16	70
High school	5	22
PUC	2	8
Occupation		
Not working/Housewife	19	83
Working	4	17

Majority of the mothers were in the age group of 31-40 years. Majority 70% had primary education and only 4(17%) were working mothers (Table 3).

Knowledge of mothers' and youth on hemophilia

Table 4: Knowledge of mothers' and youth on hemophilia

Knowledge on hemophilia	Mothers (n=23)	Youth (n=27)
Good knowledge (24-30)	1(4%)	1(4%)
Moderate knowledge(16-23)	10(44%)	18(67%)
Poor knowledge (0-15)	12(52%)	8(30%)

Majority (52%) of mothers had poor knowledge (scores between 0 to 15) whereas among youth majority (67%) of them had moderate knowledge.

Area wise comparison of knowledge scores between mothers and youth
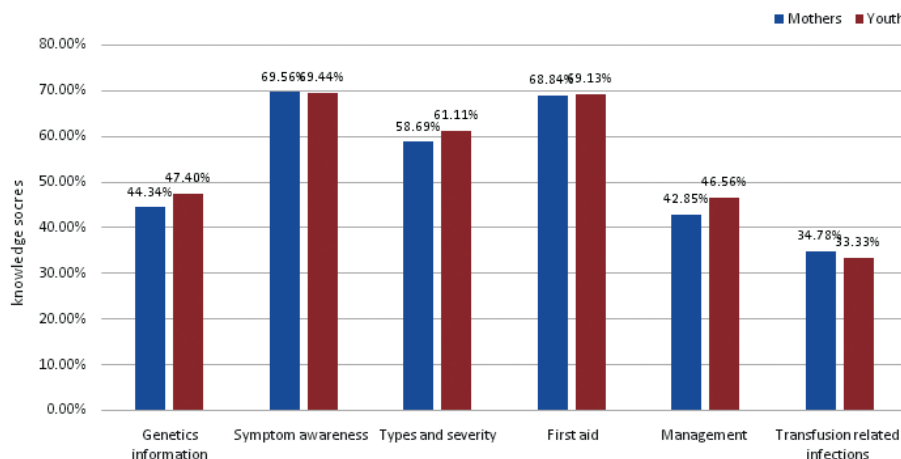
Fig. 1: Comparison of Knowledge among mothers and youth

Area wise comparison of knowledge of mothers and youth on hemophilia were analyzed. It was found that highest knowledge was in the areas of symptom awareness (mothers'=69.56%, youth=69.44%) and first aid (mothers'=68.84%, youth=69.13%). They had lowest knowledge in the areas of transfusion related infections. Knowledge scores of mothers' and youth in all areas were almost equal.

Item wise knowledge on hemophilia among mothers' and youth: Knowledge on hemophilia had 30 questions. Item wise analysis was carried out to compare the knowledge of mothers' and youth specific to each question.

Table 5: Knowledge mothers' and youth on genetics information, type and severity of hemophilia

Knowledge	Mothers' (n=23)	Youth (n=27)
Hemophilia is a genetic disease, and a X-linked disease	11(48%)	15(55%)
Hemophilia genes are transmitted from father to a daughter	8(35%)	3(11%)
Awareness about chance of son getting hemophilia if a affected male marries a normal female	10(43%)	16(59%)
Hemophilia A means factor 8 deficiency	18(78%)	20(74%)
Moderate hemophilia means factor level 1-5%	9(39%)	20(74%)

Fifty five percent of youth were aware that hemophilia was a genetic disease and a X-linked disease, but only 11% said that hemophilia genes were transmitted from father to daughters. Majority (78% of mothers and 74% of youth) knew that hemophilia A means factor 8 deficiency but only 39% of mothers' were aware that the factor level was 1-5% in moderate hemophilia.

Table 6: Knowledge on first aid, managing bleeds and transfusion related infections among mothers' and youth

Knowledge	Mothers' (n=23)	Youth (n=27)
Ice application is the first aid for joint bleed	20(87%)	26(96%)
Aspirin should be avoided in a person with hemophilia	9(40%)	8(30%)
Doing exercise keeps a person with hemophilia healthy	14(61%)	18(67%)
Aware that hemophiliacs are at risk of HIV/AIDS	6(26%)	4(15%)
Hepatitis B is transmitted from infected needles and syringes	9(39%)	14(52%)

Majority (87% of mothers' and 96% of youth) said that ice application is the immediate first aid measure for joint bleeds, 30% of youth said that aspirin need to be avoided by a person with hemophilia. Most of them (61% of mothers' and 67% of youth) were knowing that doing exercise keeps them healthy. Only 26% of mothers' and 15% of youth were aware about the risk of getting HIV/AIDS in hemophiliacs, and 52% of youth were aware that hepatitis B is transmitted from infected needles and syringes.

DISCUSSION

Hemophilia being a chronic, inherited disease PWH need to be aware about the disease for preventing further complications. In the present study a total of 50 PWH were enrolled.

PWH with moderate and severe hemophilia has frequent bleeds and in developing country like India they are not on regular prophylactic treatment due to non-availability of factor concentrate[15]. The majority of the participants in this study were not recording bleeds in a book which was essential in hemophilia management. This would help to analyze the target joints and the frequency of bleeding episodes. Being an inherited disorder family history has been reported among 40-71% of cases[16]. This study also found family history among 56% of participants.

Majority of the youth reported moderate knowledge which is supported by a study done by Miller KL *et al*. on patients' knowledge level of treatment and sources of treatment –related information among adults and their caregivers[17]. It was reported high and high-medium knowledge levels about hemophilia A among 80% of respondents. The present study also found that majority of the mothers had below average knowledge on hemophilia. A study done by Phadnis *et al*.[18] on impact of health education intervention on knowledge and health related quality of life among parents reported that the mean knowledge score before the intervention was below 50%.

The areas like genetics were unclear for the youth and mothers also. The study found that few are aware that hemophilia genes are passed to the daughters by the affected fathers. A qualitative study among young boys with hemophilia shown that genetic knowledge was formed within the context of normal day to day lives within families affected by hemophilia, with parents and hemophilia center staff being source of information.[19] Another study shown that 89% knew the heredity for hemophilia i.e. a healthy son and a carrier daughter[20].

In this study most of the mothers did not know that in moderate hemophilia the factor concentrate level is 1-5%, but majority were aware that hemophilia A occurs due to factor 8 deficiency. Lindwall K *et al*. reported in a study that 22(5%) of patients did not know the severity of their disease [21]. This study also reported that warm joints is the warning sign of bleed. Hemophilia is invisible with few signs of illness unless there is an acute bleed. Bleed recognition is important to prevent hemarthrosis[22].

The main goal of rehabilitation in developing countries is to restore joint and muscle function with isometric, isotonic and resistive exercises. Without regular physical activity adolescents are often overweight and at greater risk of recurrent haemarthrosis. So safe home exercise programme need to be emphasized for parents[23].This study showed that 61% of mothers and 67% of youth were aware that doing exercise keeps a PWH healthy.

Another significant problem for people with hemophilia is transfusion related infections like hepatitis B, hepatitis C and HIV[8]. However our data showed that almost 39% of mothers and 52% of youth did not know that hepatitis B is transmitted from infected needles and syringes.

One of the limitation of this study was small sample size and this included only specific questions which restricted response from the participants. The results from this study provides important implications towards need for organizing educational programs for parents and youth.

CONCLUSIONS

The study findings shosswn that level of knowledge about hemophilia and its treatment is low among mothers' compared to youth. Systematic education and reinforcement is required to improve the knowledge.

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Prevalence of Musculoskeletal Disorders among Dental Professionals–A Questionaire Study

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ABSTRACT

Aim: The aim of this study was to find the prevalence of musculoskeletal disorders(MSDs) among dental professionals and to analyze the effect of work related risk factors on these MSDs

Methodology: The 12 item closed ended questionnaire was formulated and was validated by 30 different subject experts and the modifications suggested were implemented. Questionnaires were distributed among 200(82 females and 118 males) dental professionals in Bangalore. The questionnaire was divided into 3 sections. The first section was demographic data which included gender, age, years of experience, acquired specialization and work duration .The second section included questions regarding work conditions (working posture, work with or without an assistant, exercising habit, breaks between the treatment, history of musculoskeletal disorders) .The third section included MSDs and its interference in clinical practice.The responses were tabulated and Statistical analysis was performed using SPSS version 21.

Results: The study showed that more than 97% of surveyed dental professionals experienced pain and disability in the neck (56%),back region(43%) ,hand and wrists region (25%), hip joint (24%), shoulder area (34%) and knee (19%).It was recognized that limited ergonomics in the work environment of the dentists results in MSDs. Maintaining proper ergonomic positions, using ergonomic equipment, taking breaks, as well as exercising regularly can prevent this devastating occupational health problem.

Conclusion: This study indicates that the surveyed dental professionals demonstrated improper working habits and deficiency of basic knowledge of ergonomics which results in MSDs, and its prevalence is very high.

Keywords: *dentistry, ergonomics, musculoskeletal disorders, occupational health hazards*

INTRODUCTION

Occupational health hazards are commonly found in almost every profession. For this reason, occupational health and productivity of the employed population must be continuously studied, and preventive measures should be taken. Dental professionals in particular are at a very high risk of developing work-related musculoskeletal disorder. Musculoskeletal disorder (MSD) is one obvious hazard and significant problem that are concerned with

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nerve, muscle, tendons and supporting structures. It is characterized by the presence of discomfort, disability or persistent pain, caused or aggravated by repeated movements and prolonged awkward or forced body postures. These disorders commonly occur in the neck, shoulders, back, wrist, and hand regions.[1] These disorders are considered to be work-related when the work environment and the performance of work contribute significantly, but are only one of a number of factors contributing to the causation of a multifactorial disease.[2] The WHO defines an Musculoskeletal disorder(MSD) as a "a disorder of the muscles, tendons, peripheral nerves or vascular system not directly resulting from an acute or instantaneous event (e.g., slips or falls). The term "work related musculoskeletal disorders "(WMSDs) refers to MSDs that are made worse by work conditions.[3]

Dental professionals have a job that requires continuously maintaining certain postures in order to carry out their routine examinations and procedure. These postures make them vulnerable to developing different types of musculoskeletal disorders causing pain, stiffness, restriction of activities.[4] Literature suggests that the prevalence of general musculoskeletal pain ranges between 64% - 93%. The most prevalent regions for pain in dental professionals are the back (36.360.1%) and neck (19.8-85%)region.[5] About 60-80% of them experience low back pain during their career and is the second leading cause of intentional absence from work.[4]

Hence the concept of ergonomics was introduced into dentistry in order to improve the dental professionals working conditions. In Greek, 'Ergo' means "work" and 'Nomos' means "natural laws or systems". Ergonomics, therefore, is an applied science concerned with designing procedures for maximum efficiency and safety.[6]

Dental professionals must understand the mechanisms that contribute to MSDs. Having this knowledge is key in preventing and managing work related musculoskeletal problems in clinical dentistry.[2] Hence the aim of this study was to assess the relationship of musculoskeletal disorders in dental professionals.

MATERIALS AND METHODS

Ethical clearance was obtained from college ethical committee. The 12 item closed ended questionnaire was formulated and was validated by 30 different subject experts and the modifications suggested were implemented. Questionnaires were distributed among 200(82 females and 118 males) dental professionals in Bangalore. The questionnaire was divided into 3 sections. The first section was demographic data which included gender, age, years of experience, acquired specialization and work duration .The second section included questions regarding work conditions (working posture, work with or without an assistant, exercising habit, breaks between the treatment, history of musculoskeletal disorders) .The third section included MSDs and its interference in clinical practice.The responses were tabulated and Statistical analysis was performed using SPSS version 21.

RESULTS

The study consisted of 200 participants of various specializations in different fields of dentistry: 2% general practitioners (without speciality), 20% endodontists, 18% prosthodontists, 15% oral surgeons, 6% pedodonsts, 25% periodontists, 9% orthodontists and 4% oral medicine and radiologists.

The study showed that more than 97% of surveyed dental professionals experienced pain and disability in the neck (56%),back region(43%) ,hand and wrists region (25%), hip joint (24%), shoulder area (34%) and knee (19%).

Table 1: Association between gender and MSDs

	Males (n- 118)	%	Females (n- 82)	%	P value
CALF	24	20%	19	23%	0.56
NECK	73	61%	40	48%	0.04*
BACK	46	38%	38	46%	0.23
SHOULDER	38	32%	30	36%	0.66
ELBOW	41	34%	36	43%	0.17
WRIST	30	25%	26	31%	0.11
HAND	28	23%	22	26%	0.68
HIP/THIGH	18	15%	24	29%	0.56
KNEE	22	18%	17	20%	0.72
ANKLE/ FOOT	28	23%	20	24%	0.43

There was statistically significant association seen with males being more commonly affected with neck pain (61%).

Table 2: Association between posture and MSDs

	Sitting (n- 67)	%	Standing (n- 10)	%	Both (n-123)	%	P value
CALF	13	19%	10	100%	20	16%	0.13
NECK	46	68%	7	70%	29	23%	0.02*
BACK	17	25%	9	90%	38	30%	0.02*
SHOULDER	16	23%	8	80%	20	16%	0.51
ELBOW	22	32%	6	60%	31	25%	0.02
WRIST	14	20%	9	90%	21	17%	0.55
HAND	11	16%	7	70%	22	17%	0.35
HIP/THIGH	10	15%	0	0	17	13%	0.04*
KNEE	8	11%	4	40%	21	17%	0.03*
ANKLE/FOOT	18	26%	5	50%	14	11%	0.04*

In this study we analysed the relationship between MSDs and posture of dental professionals. 68% dental professionals working in sitting position reported neck pain followed by elbow pain (32%). 100% dental professionals working in standing position reported calf pain while 90% reported pain in the back and wrist region. Over 61 % dental professionals working in both sitting and standing position, 30% declared pain in the back region followed by neck pain (23%). The influence of work posture on TMD is shown in table2.

Table 3: Association between breaks during treatment and MSDs

	YES (n – 154)	%	NO (n- 46)	%	P VALUE
CALF	14	9%	29	63%	0.12
NECK	45	29%	28	60%	0.03*
BACK	25	16%	19	41%	0.22
SHOULDER	27	17%	41	89%	0.14
ELBOW	26	16%	21	45%	0.43
WRIST	10	6%	40	86%	0.01*
HAND	18	11%	32	69%	0.15
HIP/THIGH	14	9%	28	60%	0.21
KNEE	15	9%	24	52%	0.33
ANKLE/ FOOT	18	11%	30	65%	0.34

The study results showed a significant correlation between musculoskeltal symptoms and rest breaks during the practice. Dental professionals (89%) who did not take rest or break during work reported shoulder and wrist pain (86%) which was followed by hand (69%) and ankle pain (65%).

Table 4: Association between dentists working hours and MSDs

	8-24 hrs/week	24-32 hrs/week	P VALUE
CALF	19 %	24 %	0.25
NECK	36 %	77 %	0.01*
BACK	36 %	48 %	0.34
SHOULDER	20 %	48 %	0.02*
ELBOW	36 %	41 %	0.55
WRIST	21 %	27 %	0.69
HAND	20 %	30 %	0.42
HIP/THIGH	18 %	31 %	0.33
KNEE	17 %	22 %	0.86
ANKLE/ FOOT	16 %	32 %	0.36

The present study also shows correlation between musculoskeletal symptoms and working hours of dental professionals . It was found that 36% of dental professionals who are working for 8- 24 hrs/week were reported with neck pain ,back pain and elbow pain while 77% of them working for 24-32 hrs/week reported with neck pain followed by back and shoulder pain (48%).

Hence, the results of the present survey reveals that neck pain was most common among dental professionals.

DISCUSSION

The first aim of this study was to find the prevalence of MSDs among dental professionals. The second aim was to analyze the effect of work related risk factors on these MSDs. Factors assessed were working hours, working posture and rest breaks during treatment. It has been hypothesized that the type and/or severity of symptoms might be related to the duration of working without a break.[7] When the human body is subjected repeatedly too prolonged static postures, it can initiate a series of events that may result in pain, injury or a career-ending MSD. Muscle imbalances, ischemia, trigger points, joint hypomobility and spinal disk degeneration are some of the physiological consequences of Prolonged Static Postures (PSPs). The mechanism of musculoskeletal disorder can be explained by flow chart:[2] (Figure 1)

Åkesson et al revealed that the work posture of dental professional plays an important role as a risk factor for the development of work-related disorders.[8] As seen in our study , maintaining poor posture for long periods of time can result in chronic muscular fatigue, discomfort or pain, even if the soft tissues are not structurally altered. Research shows that maintaining the low back curve-the lumbar lordosis-when sitting can reduce or prevent low back pain . Proper selection, adjustment and use of magnification systems have been associated with decreased neck and low back pain, as they allow operators to maintain healthier postures .Dental professional should also adjust the features of their chairs to obtain maximal ergonomic benefits.[1]

Lehtoet al showed that 42% of the dental professional had pain in neck and shoulder.[9] Similarly Bernard et al also found that 48% of dentist had work related neck pain ,42% had back pain , and 37% shoulder pain.[10] In accordance to these studies our study also found a significantly increased prevalence of neck pain (56%) and

followed by back pain (42%). Szymańska discovered that more than 30% of the dental professionals work without breaks and nearly one-third of them are not aware of the preventive role of rest breaks, which will eventually lead to fatigue and disorders. In our study, we observed that the participants who did not use rest breaks more often experienced shoulder pain compared to participants who take rest in between the treatment .[11.] To prevent this, the dental professionals should allow for rest periods to replenish and nourish the stressed structures. Regular rest breaks and physical exercise are recommended to prevent the accumulation of harmful agents. Alternating between standing and sitting also can be an effective tool in preventing injuries. Dental professionals should take the time to position their patients properly for mandibular and maxillary procedures. When possible, they should position instruments within easy reach. Therefore short rest breaks used in dental practice at regular intervals can lessen the discomfort in the musculoskeletal and nervous system.

Dental professionals may use various stress-reduction techniques to decrease stress related muscular tension.[1]Al-Wazzan et al. recommended aerobic and relaxation exercises to be included in the weekly activities of dental professional. A 30-minutes aerobic program three times a week is ideal for overall fitness.[12] Gupta et al. on the other hand recommended a Complementary and alternative medicine (CAM) which can be helpful in managing and preventing these MSDs.[13]

Summarizing the above, this study indicates that the surveyed dental professionals demonstrated improper working habits and deficiency of basic knowledge of ergonomics. Dental professional should seek out and receive education about musculoskeletal health, injury prevention and dental ergonomics for protecting their own health. They can be taught to manage and prevent injuries effectively. They can educate themselves and their staff members using a multifactorial approach that includes preventive education, postural and positioning strategies, proper selection and use of ergonomic equipment, and frequent breaks with stretching and strengthening techniques. Ideally, this education should begin during dental school and should continue through the dentist's professional life.[2] According to Newell and Kumar dental professional can reduce the risk of developing MSDs by using proper body posture and positioning during clinical procedures, incorporating regular rest breaks, maintaining good general health, and performing exercises for the affected regions of the body.[14]

CONCLUSION

In conclusion, it was recognized that limited ergonomics in the work environment of the dentists results in MSDs, and its prevalence is very high. The symptoms of MSDs increase with the number of years of practice. Maintaining proper ergonomic positions, using ergonomic equipment, taking breaks, as well as exercising regularly can prevent this devastating occupational health problem. The prevention and reduction of MSDs among dental professionals should include their education in dental ergonomics and awareness regarding the importance of work-related risk factors.

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Socioeconomic and Regional Disparities in Under-Five Mortality in India

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ABSTRACTS

Background: India has the world's highest total number of under-five deaths. Although in last one and half decades, under-five mortality has declined substantially from 115 deaths per 1000 live births in 1990 to 60 deaths per 1000 live births in 2010, still India continues to be the top contributor of under-five deaths. Under-five mortality varies substantially across regions and socioeconomic groups. The present study attempts to assess the socioeconomic and regional disparities and trace the trends and pattern of Under-Five Mortality in India, over last one and half decade, using National Family Health Survey Data.

Methods: Data from three rounds of the National Family Health Survey (NFHS-I, II & III) were analyzed to identify the disparities and nature of the association between under-five mortality and selected socioeconomic characteristics, bivariate and multivariate Cox proportional hazard model (both separate and pooled) analysis were performed.

Key Findings: In India, there has been a decline in overall under-five mortality but still disparities in under-five mortality by mother's age at birth, the composite variable of birth order and birth interval, economic status, sanitation facility and region of residence were evident from analysis. Controlling for a set of socioeconomic and regional factors, the hazard of under-five mortality was less (CHR=0.69 CI=0.68-0.70) (AOR=0.83 CI=0.82-0.85) and (CHR=0.87 CI=0.86-0.88) (AOR=0.89 CI=0.88-0.91) during the period 2005-06 and 1998-1999 respectively as compared to period 1992-1993.

Conclusion: Socioeconomic and regional disparities were clearly indicated in under-five mortality in India during last one and half decade, (1990-2006). Initiatives to addresses social determinants of health which have impact on under-five mortality, such as mother's age at the time of birth, economic status, level education, birth order and interval along with safe sanitation facility need to be stepped up especially for EAG states. The government of India needs to proceed with integrated approaches for child health, especially in rural India.

Keywords: *NFHS, Pooled data, Under-five mortality.*

INTRODUCTION

India has the world's highest percentage (21%) of under-five deaths, estimated at 1726000 in 2009. The country managed to reduce the under-five mortality rate (U5MR) from 118 per 1000 live births in 1990 to 66 per 1000 live births in 2009. India fails to achieve its Millennium Development Goal (MDG) 4 that targets minimizing under-five mortality to 39 per 1000 live births by 2015[1]. Social and economic development of a nation is often reflected by the existing infant and child mortality rates. A number of studies attempted to demonstrate the direct and indirect causes of childhood illnesses, but none of them proved as influential in formulating public policy [2-4]. The famous Moseley and Chen analytical framework to assess childhood mortality for developing world is based on the premises that socioeconomic factors must operate through five broad groups of proximate determinants: maternal factors, nutrient deficiency, environmental contamination, injury and personal illness & control, to exert an impact on child mortality [5]. A lot of work has been done to study proximate determinants but there is little evidence that highlights the socio-economic

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and regional disparities. Thus, the present study is a modest approach in this direction.

Methodology: This study is based on three rounds of the National Family Health Survey (NFHS-I, II & III) data [6-8]. All the three rounds of the survey are nationally representative and have covered 99% of India's population. Under-five mortality (a child who died before his/her fifth birthday) was the outcome variable of interest. Socioeconomic and regional predictors such as current age of mother, mother's age at the time of childbirth, mother's education, father's education, mother's occupation, father's occupation, religion, social group, mass media exposure, birth order and interval, wealth quintile, safe sanitation facility, safe toilet facility, safe drinking water facility, place of residence, city wise residence and region of residence were included as predictor variables in the study. Socioeconomic and regional variables were categorized into three categories namely individual, household and community characteristics. India was divided into six regions based on geographical location and cultural settings. The six regions consist of North (Jammu and Kashmir, Himachal Pradesh, Punjab, Haryana, Rajasthan, Delhi and Uttaranchal), Central (Uttar Pradesh, Madhya Pradesh and Chhattisgarh), East (Bihar, Jharkhand, West Bengal and Orissa), North-East (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura), West (Gujarat, Maharashtra and Goa), and South (Andhra Pradesh, Karnataka, Kerala and Tamil Nadu).

Statistical Analysis: The whole analysis was performed using STATA version 13.0. The study used pooled multivariate Cox proportional hazard model to assess the influence or the strength of selected key Individual, household, community predictors in explaining under-five mortality.

RESULTS

Table 1 represents the weighted percentage distribution of the women age group 15-49 years. About half of the women age were 35 years and above at the time of survey irrespective of time (1990-93, 1996-99 and 2003-2006). In all the 3 NFHS surveys it was found that Majority (66 %) of the women had their first child during the early (15-24 years) phase of their life. More than two third (69.2%), women were illiterate during 1990-93 while 62.8% and 59.8% women were illiterate during 1996-99 and 2003-2006 respectively. The majority of the respondent almost 80 percent belonged to the Hindu religion irrespective of the time period. More than two-third of women were from other than SC/ST Social group. More than two third women belonged to rural areas, and almost one-fourth belonged to poorest wealth quintile irrespective of the time period. In all the 3 surveys only one-third household were using safe sanitation.

Table 1: Percentage distribution of women (having at least one birth history) by individual, household and community level characteristics, India, 1990–2006.

Background characteristics	NFHS-1 (1990–93)		NFHS-2 (1996–99)		NFHS-3 (2003–06)	
	%	n	%	n	%	n
Individual characteristics						
Current mother's age						
15-24	12.8	35026	12.2	32382	10.8	29907
25-34	37.3	101845	37.7	100341	36.8	102231
35-49	49.9	136445	50.2	133712	52.4	145308
Mother's age at the time of childbirth						
15-24	63.3	173107	66.5	177048	65.7	182297
25-34	33	90142	30.8	82009	31.4	87249
35-49	3.7	10102	2.8	7377	2.8	7901
Birth order and interval						
Birth order 1	28.4	77655	29.8	79255	31.6	87567
Birth order-2/3 and interval<=24	15.4	42121	16.5	43911	16.9	46907
Birth order-2/3 and interval>24	26	70873	26.3	70051	26.9	74587
Mother's education						
Illiterate	69.2	188612	62.8	167236	59.8	165819
Literate	30.8	83945	37.2	99130	40.2	111615

Conted…

Household characteristics						
Religion						
Hindu	80.6	220220	80.2	213379	79.7	220842
Non-Hindu	19.4	53130	19.8	52834	20.3	56292
Social group						
Scheduled caste (SCs)	13	35446	19.7	51755	20.8	56164
Scheduled tribe (STs)	8.9	24297	9.2	24211	9.2	24999
Others than SC/ST	78.1	213608	71.1	187345	70	189375
Wealth quintile						
Poorest	25.1	67286	24.9	66447	22.9	63475
Poorer	24.5	65701	24.3	64850	22.2	61491
Middle	20.3	54488	20.4	54349	20.3	56394
Richer	16.6	44463	17.2	45903	18.7	51778
Richest	13.5	36273	13.1	34885	16	44309
Sanitation facility						
Unsafe	72.9	199241	68.2	181724	63.6	176394
Safe	27.1	73930	31.8	84680	36.4	100768
Drinking water						
Unsafe	61.9	169317	47	125270	16.3	45174
Safe	38.1	104033	53	141164	83.7	232273
Community characteristics						
Type of residence						
Urban	24.1	66005	23.8	63365	27.3	75796
Rural	75.9	207345	76.2	203069	72.7	201651
Region						
North	11.8	32318	12.4	32942	13.4	37041
Central	27.3	74536	27.3	72662	28.1	77975
East	22.2	60730	22	58507	23.7	65619
Northeast	4.3	11743	3.5	9222	3.5	9750
West	13.7	37406	13.7	36456	13.2	36728
South	20.7	56617	21.3	56644	18.1	50334
Total	**100**	**273350**	**100**	**266434**	**100**	**277446**

Note: All 'n' are weighted. Total may not be equal due to some missing cases.

Determinants of under-five mortality: Table 2 reiterate that some important factors such as mother age at the time of childbirth, birth order and birth interval, women education, wealth quintile, sanitation facility, cooking fuel, place of residence and regions of the residence is significantly associated with under five mortality irrespective of time period. After controlling the other socioeconomic variables, the hazard of under-five mortality was highest among births to mothers aged 25-34 years (HR=3.00, 95% CI=2.90-3.10) and mothers aged 35 years or more (HR=6.87 95% CI=5.69-8.14) than with births to the mother's age at childbirth 15-24 years during 1990-93. For 1992-1993, babies with birth order four or more and the birth interval were less than two-year had more (HR=3.34 95% CI=3.21-3.47) hazard of death under five compared with first birth order baby and same trend observed during 1996-99 and 2003-06. Table 2 finds an inverse relationship between wealth quintile and under-five mortality hazard. Results clearly indicate that children born to the household having safe

sanitation, safe cooking fuel, safe drinking water have less hazard of under-five mortality than those born to the household having unsafe practices.

Table 2: Adjusted hazard ratio of under-five mortality by selected individual, household and community characteristics, in India, 1990–2006

Background characteristics	Under-five mortality					
	NFHS-1 (1990–93)		NFHS-2 (1996–99)		NFHS-3 (2003–06)	
	AHR	95% CI	AHR	95% CI	AHR	95% CI
Individual characteristics						
Current mother's age						
15-24	1.00		1.00		1.00	
25-34	0.11***	[0.10-0.11]	0.10***	[0.10-0.11]	0.09***	[0.09-0.10]
35-49	0.01***	[0.01-0.01]	0.01***	[0.01-0.01]	0.01***	[0.01-0.01]
Mother's age at the time of childbirth						
15-24	1.00		1.00		1.00	
25-34	3.00***	[2.90-3.10]	3.01***	[2.90-3.12]	3.07***	[2.95-3.20]
35-49	6.87***	[5.69-8.14]	6.46***	[5.76-9.31]	7.87***	[6.23-9.69]
Birth order and interval						
Birth order 1	1.00		1.00		1.00	
Birth order-2/3 and interval<=24	1.89***	[1.83-1.95]	1.79***	[1.73-1.85]	1.79***	[1.72-1.85]
Birth order-2/3 and interval>24	1.31***	[1.27-1.36]	1.30***	[1.25-1.35]	1.12***	[1.07-1.17]
Mother's education						
Illiterate	1.00		1.00		1.00	
Literate	0.96***	[0.93-0.99]	1.03***	[1.00-1.07]	0.94***	[0.92-0.99]
Household characteristics						
Religion						
Hindu	1.00		1.00		1.00	
Non Hindu	0.86***	[0.83-0.89]	0.94***	[0.91-0.98]	1.00	[0.96-1.03]
Social group						
Scheduled caste (SCs)	1.00		1.00		1.00	
Scheduled tribe (STs)	0.78***	[0.74-0.81]	0.99***	[0.95-1.04]	1.07	[1.02-1.12]
Others than SC/ST	0.95***	[0.92-0.98]	0.94***	[0.92-0.97]	0.99	[0.96-1.02]
Wealth quintile						
Poorest	1.00		1.00		1.00	
Poorer	0.90 ***	[0.87-0.93]	0.85***	[0.82-0.88]	0.83***	[0.79-0.86]
Middle	0.75***	[0.73-0.78]	0.73***	[0.70-0.76]	0.69***	[0.66-0.72]
Richer	0.61***	[0.58-0.64]	0.58***	[0.55-0.61]	0.56***	[0.53-0.59]
Richest	0.44***	[0.41-0.47]	0.42***	[0.39-0.45]	0.37***	[0.34-0.40]
Sanitation facility						
Unsafe	1.00		1.00		1.00	
Safe	0.91***	[0.87-0.94]	0.93***	[0.87-0.95]	0.91***	[0.87-0.95]
Drinking water						
Unsafe	1.00		1.00		1.00	
Safe	0.91***	[0.88-0.93]	0.93***	[0.90-1.03]	0.99	[0.95-1.02]
Community characteristics						
Type of residence						
Urban	1.00		1.00		1.00	
Rural	0.95**	[0.91-0.98]	0.96***	[0.92-0.99]	0.92***	[0.88-0.96]
Region						
North	1.00		1.00		1.00	
Central	1.35***	[1.31-1.40]	1.15***	[1.11-1.19]	1.17***	[1.13-1.23]
East	1.00***	[0.96-1.04]	0.81***	[0.78-0.84]	0.95	[0.91-1.00]
Northeast	0.91***	[0.86-0.97]	0.78***	[0.74-0.83]	0.95	[0.90-1.01]
West	0.86***	[0.82-0.90]	0.80***	[0.76-0.83]	0.84***	[0.80-0.89]
South	0.84***	[0.80-0.87]	0.67***	[0.64-0.70]	0.65***	[0.64-0.71]

*p<0.10; **p<0.05; ***p<0.01.AHR: Adjusted Hazard Ratio

Determinants of under-five mortality from pooled data: Table 3 presents the influence of socioeconomic predictors on the under-five mortality during 1990–2006 from pooled data, controlling for a set of socioeconomic and regional factors, during 2005-2006, hazard of under-five mortality was less (CHR=0.69 95% 95% CI=0.68-0.70) (AHR=0.83 95% CI=0.82-0.85) and (CHR=0.87 95% CI=0.86-0.88) (AHR=0.89 95% CI=0.88-0.91) during the period 2005-06 and 1998-1999 respectively as compared to period 1992-1993. The overall hazard of under-five mortality was 5 time (AHR=5.50 95% CI=5.64-7.39) and 3 times (CHR=3.86 95% CI=3.71-4.02) more likely among births to mothers aged 35 years and above as compared with births to the mother's age at childbirth 15-24 years. Children born to the richest household were at 59 percent less risk of under-five mortality as compared to their counterpart. Analysis indicates that the women belonging to the south region had 27% less hazard of under-five mortality as compared to women belonging to north India. Women belonging to the other then SC/ST social group are at low risk of under-five mortality. The adjusted hazard shows that children born to the household having safe sanitation, safe cooking fuel, safe drinking water were less hazard of under-five mortality.

Table 3: Hazard ratio of under-five mortality by selected individual, household and community characteristics, in India, 1990–2006 (pooled data)

Socio- demographic characteristics	Under-five mortality			
	Crude HR	**95% CI**	**AHR**	**95% CI**
Period				
1990–93 (ref)	1.00		1.00	
1996–99	0.87***	[0.86-0.88]	0.89***	[0.88-0.91]
2003–06	0.69***	[0.68-0.70]	0.83***	[0.82-0.85]
Individual characteristics				
Current mother's age				
15-24 (ref)	1.00		1.00	
25-34	0.16***	[0.16-0.17]	0.10***	[0.10-0.10]
35-49	0.02***	[0.02-0.02]	0.01***	[0.01-0.01]
Mother's age at the time of childbirth				
15-24 (ref)	1.00		1.00	
25-34	1.44***	[1.42-1.47]	3.02***	[2.96-3.08]
35-49	3.86***	[3.71-4.02]	5.50***	[5.64-7.39]
Birth order and interval				
Birth order 1 (ref)	1.00		1.00	
Birth order-2/3 and interval<=24	1.51***	[1.48-1.54]	1.83***	[1.79-1.86]
Birth order-2/3 and interval>24	0.95***	[0.93-0.97]	1.25***	[1.23-1.28]
Mother's education				
Illiterate (ref)	1.00		1.00	
Literate	0.57***	[0.57-0.58]	0.88**	[0.86-1.00]
Household characteristics				
Religion				
Hindu (ref)	1.00		1.00	
Non-Hindu	0.81***	[0.79-0.82]	1.93***	[0.91-1.95]
Social group				
Scheduled caste (SCs) (ref)	1.00		1.00	
Scheduled tribe (STs)	0.96***	[0.94-0.99]	0.94***	[0.91-0.96]
Others than SC/ST	0.78***	[0.77-0.80]	0.96***	[0.95-0.98]

Conted…

Wealth quintile				
Poorest (ref)	1.00		1.00	
Poorer	0.78***	[0.76-0.79]	0.87***	[0.85-0.88]
Middle	0.58***	[0.57-0.59]	0.73***	[0.71-0.75]
Richer	0.42***	[0.41-0.43]	0.59***	[0.57-0.61]
Richest	0.26***	[0.25-0.26]	0.41***	[0.39-0.43]
Sanitation facility				
Unsafe (ref)	1.00		1.00	
Safe	0.47***	[0.47-0.48]	0.72***	[0.77-1.09]
Drinking water				
Unsafe (ref)	1.00		1.00	
Safe	0.62***	[0.62-0.63]	0.96***	[0.94-0.97]
Community characteristics				
Type of residence				
Urban (ref)	1.00		1.00	
Rural	1.71***	[1.68-1.74]	0.94***	[0.92-0.96]
Region				
North (ref)	1.00		1.00	
Central	1.72***	[1.68-1.75]	1.23***	[1.20-1.26]
East	1.26**	[1.23-1.29]	0.92***	[0.89-0.94]
Northeast	0.97***	[0.94-1.00]	0.88***	[0.84-0.91]
West	0.83***	[0.81-0.86]	0.82***	[0.80-0.85]
South	0.81***	[0.79-0.83]	0.73***	[0.71-0.75]

*p<0.10; **p<0.05; ***p<0.01.AHR: Adjusted Hazard Ratio

DISCUSSION AND CONCLUSION

The present study has comprehensively demonstrated the socioeconomic trends of under-five mortality with considerable disparities across regions for instance, under -five deaths are still considerably higher among Central, East and Northeast states as compare with other Southern India states. Similarly, under-five deaths among poor households, the resident of rural areas, illiterate and Scheduled Castes/Tribes remain to be higher than their counterparts. Both bivariate and multivariate analysis indicates that children born during 2005-2006 the hazard risk of under-five mortality were less compared to period 1992-1993. The results of this study indicated that the women age 35 years and above at the time of birth, children have more risk to dying before five years as compared to women age 15-24 years at the time of childbirth similar findings were reported by other studies [9-10]. Biologically a male child is at higher risk of mortality but this study found that the risk of under-five mortality was higher among female child as compared to a male child which might be related to behavioral and gender inequality in nutrition and health care [11-12]. The study indicates that birth order and birth interval were positively associated with under five mortality which is also reflected in other studies [13]. The disparities in under-five mortality across the different regions of the country may be partly linked to the diversity of regions in terms of availability of resources and the state of socioeconomic and demographic progress.

This study concludes that over the last one and a half decades, decrease in under-five mortality was evident in India. The study reveals the socio-economic and regional disparities in under-five mortality in India and found that some factors such as mother's age at the time of birth, sex of a child, birth order and interval, wealth index, and region of residence are important in under-five mortality. The focus should be more on states like Uttar Pradesh, Rajasthan and Madhya Pradesh of

the north and central regions, which alone constitute 45% of the total population of India and also have higher mortality rates. Efforts are needed to educate young women in matters of reproductive health and the benefits of delaying pregnancies. Maternal education, both in formal and informal sectors, can improve their utilization of antenatal care and postnatal care services. This will ultimately be helpful to achieve the target of reducing under-five death and in addressing socioeconomic disparity across different regions.

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Training and Evaluation of Module of Self Concern Sexual Education on Facilitator's Efficiency

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ABSTRACT

This study aimed to observe and evaluate the coaching program of sexual education*(Training of Trainer)* on facilitator by using *(Self-Concern Sexual Education Module)* based on Knowledge, Skills and Attitudes. This study involved 80 students of Sultan Idris Education University that were randomly selected and trained to be facilitators by using *Self-concern Module.* This study used a research design of pre-test and post-test, and experiment was used to collect data. The subjects were divided into two groups, the control group (40 students) and treatment group (40 students). The treatment group received the TOT program and followed all the units in*Self-concern Module.* While the control group just received the circulation of information about sexual education as general and there was no any specific training given to them. The data was analyzed using Statistical Package for Social Science (SPSS) version 22 to check for the mean differences between the two groups. The findings showed that there were difference between the means of pre and post of the two groups. The results showed that the mean scores of all three aspects of Knowledge, Skills and Attitudes of facilitators increased after followed the coaching program. Mean score of Knowledge aspect showed the highest score, 3.94, compared to mean scores of Skills and Attitudes. This shows that module is very effective to increase facilitators' knowledge about sexual education. Overall, this study successfully trained facilitators' efficiency in using this module.

Keywords: *facilitators, Modul of sexual education , sexual awarness, knowledge, skills, attitudes*

INTRODUCTION

The quality of sexual education in schools depends on teachers' teachings, however, the findings of studies found that the teachers failed to deliver the sexual education effectively. The teachers are lacking of self-confidence in delivering the sexual education because they do not have enough knowledge and skills.[1] A good sexual education given to children will help them to understand the sexual development in themselves and in the same time they can avoid the risk of sexual abuse. [2] In the context of education, sexual education is an explanation, guidance and counseling on the understanding of sexual and reproductive organ care. In addition, it also touches the aspects of abnormality and undesirable behaviors of sexual activities as well as harmful diseases related to them.[3]

Research Background: Sexual education is not a new issue in education. However, to implement sexual education or to discuss the issues of sex in public

(school) is perceived as controversial issue and taboo by certain people [4]. Sexual education is a vital necessity to enlighten the youth about the implications of illicit sex before marriage and teaching them to refuse sex before marriage. Sexual education is not a new thing in western countries but it is often presented to young people to reduce the social problems involving sexual misconduct. Unfortunately, the introduction of sexual education in Malaysia is still not well received and a matter of debate between those in favor and those opposed.

Sexual education can be introduced in detail appropriate to the youth's ages when they enter high schools, during adolescent period, [5] youth's desires toward sex become dominant and they need teaching and guidance regarding sex and issues related to it. Sexual education at this level can discuss more sensitive issues like family lives, sexual relationship, marriage and divorce, abortion, how to avoid harmful sex and so on [6]. Besides that, the teachers should be careful in the process of presenting sexual education's contents to the

students to avoid misinterpretation and misleading that teachers are teaching the students how to do sex. These negative feelings make teachers and educators afraid to teach and educate the students study stated factors that lead to readiness of the teachers to deliver the knowledge of sexual education are their own knowledge, sources of information, courses, workshops and training attended by the teachers. The Malaysian Secretary of National Union of the Teaching Profession (NUTP), Lok Yim Pheng admitted that teachers' lack of confidence in teaching sexual education to the students because they do not get enough training on that subject. Knowledge, Skills and Attitudes of the teachers are very important in determining the willingness of parents and youth towards acceptance of sexual education program. Those things are needed because to teach this subject in schools is very difficult, too personal and there are times when certain topics caused unease among students.[7]

Therefore, sexual education can be considered effective if teachers have the knowledge and skills. This is very important to ensure proper transference of knowledge to students. In 2011, after recognizing the importance of sexual education, teachers and educators who teach sexual education and reproductive health were trained and underwent a specific orientation session with coaches who have been designated by the ministry. Furthermore, a number of modules were enacted in Malaysia to serve as references for the teachers in teaching sexual education to the students. In 2001, National Population and Family Development Board Malaysia (NPFDB) made a teenager edition of *Self-concern Sexual Education Module*s specifically to be used by the students.

Problem Statement: Children and youth have a very high curiosity and inquisitive. This fact is proven by the questions that are frequently asked in order to get clarification and understanding of things that catch their interests. While adults are reluctant and often avoid to answer questions regarding reproduction and sex because they think their child are not matured enough to know all those stuffs. As a consequent, children and youth tend to find and get the answers from sources other than their parents and teachers.

Therefore, *(Sexual Education Self-concern Module Teenagers Edition)*(I'm In Control) by National Population and Family Development Board Malaysia was selected to be a source in training program of teen educators

and Peer Support Group at high schools, colleges and universities. These teen educators are hope to be Youth Advocators to increase awareness and skills of youth in making wise choices and actions in dealing with sexual problems such as sexually transmitted diseases, sexual harassment, sexual abuse and rape. However, according to National Population and Family Development Board Malaysia, until now, university administrations do not accept this module to be used in the sexual education course and training of facilitators. The problem of this study is Module of Self Concern Sexual Education cannot be fully implemented because NPFDB cannot get into universities to teach knowledge and skills and train students as facilitators using this module.

Because of that, this study will fill in that gap and address this issue by giving a systematic and profound training to university's students, who will be teachers in the future, to be facilitators of *Self-concern Sexual Education Module.* Through the training, these teacher-to-be students will enhance their knowledge and convince them to implement sexual education program in schools later.

Research Objective: This study aims to observe and evaluate the efficiency of facilitators in delivering sexual education to students by using *Self-concern Sexual Education Module.* This study specifically aims to access the overall impact of *Self-concern Sexual Education Module* on the control and treatment groups of facilitators based on their competencies (Knowledge, Skills and Attitudes).

LITERATURE RIVIEW

Ahmad conducted a study on the effectiveness of sexual education program specifically to testify the effects of support groups that use an approach of Al Ghazali in addressing bad sexual behavior among high school students in Johore. He found out that this approach gives significant effects to decrease those bad behaviors and increase awareness of the students.[8]

Study conducted was by to train selected teachers in sexual education training for four weeks. In the first week, the teachers were trained to change their attitudes toward sexual education and to practice good strategies to overcome cultural barriers in discussions about sexual education in public. After that, in the second week, the teachers were trained to develop high self-efficacies

in teaching and in the same time to build their self-confidences in exposing sexual education to students. In the third and fourth weeks, the teachers were exposed to skills of sexual education and effective communication between teachers and students in discussing sexual things. The results from this study found that the teachers who have been trained for four weeks are more positive and confident in delivering sexual education.[9]

Reproductive Health Education [10] conducted a study of reproductive health education on teachers. In this study, teachers were selected to be facilitators and then followed courses of sexual education and reproductive health. Among the components taught to the facilitators was knowledge about reproductive health that covers development of adolescents, adolescent sexuality, functions of reproductive system and risks in adolescents' development. The findings revealed that the levels understanding and knowledge of teachers on sexual and reproductive education are higher than before they joined the program.

As a conclusion, these literatures whether it is local or international show that sexual education program and training in delivering sexual education are very important for both teachers and students. Moreover sexual education can teach and guide students to practice safe sex and avoid unhealthy sexual behaviors.

METHODOLOGY

This study used a quasi-experiment design. Quasi-experiment is an experiment conducts on two groups, which are treatment group and control group. In this study, the treatment group received a training to be facilitators using *Self-concern Sexual Education Module* in three days. Meanwhile, the control group only received basic knowledge and information about sexuality and reproductive. Both groups then needed to answer feedback forms on their competencies that measure their Knowledge, Skills and Attitudes before and after the interventions to get pre-test and post-test results.

Research Sampling: The samples of this study were 80 students of Sultan Idris Education university, who were randomly selected to be facilitators. These samples were divided into two groups where 40 people for treatment group and the other 40 people for control group.

Research Instruments: This study used two kind of instruments; a) *Self-concern Sexual Education Module* and b) Feedback form on facilitators' competencies (Knowledge, Skills and Attitudes).

Data Analysis: Data was analyzed in a quantitative descriptive manner. The data obtained from pre-test and post-test were summation of scores calculated by Statistical Package for Social Science (SPSSP) program. Descriptive data analysis was used to look for the differences of percentage and mean for pre-test and post-test in treatment group and control group.

RESEARCH FINDINGS

Analysis for Pre-Test and Post-Test of Treatment Group: Descriptive analysis was used to identify the results of pre-test and post-test for treatment group and control group. Table 1 shows the values of mean in the treatment group that were calculated by using SPSS.

Table 1: Overall Mean Scores for Facilitator Competencies *Self-concern Moduleto*

The Treatment Group based on Knowledge, Skills and Attitudes.

	Pre (mean)	Post (mean)	Difference (mean)	Result
Knowledge	1.15	3.94	2.79	High
Skills	1.11	3.79	2.68	High
Attitudes	1.07	3.81	2.74	High

Based on mean values in Table 1, the aspect of knowledge shows the highest value compares to aspects of skills and attitudes. The increasing of mean value of knowledge aspect for treatment group makes the mean of 3.94. The difference between the pre-test and post-test for the aspect of knowledge is 2.79. While for the aspect of skills, the mean values for pre-test is 1.11 and 3.79 for the post-test, make the difference between pre-test and post-test is 2.68. Next, the mean values for attitudes aspect is 1.07 for the pre-test and 3.81 for the post-test. The difference of mean value is 2.74.

Analysis for Pre-Test and Post-Test of Control Group: Table 2 shows the mean scores calculated by using SPSS to analyze the scores for control group.

Table 2: Overall Mean Scores for Facilitator Competencies *Self-concern Moduleto*

The Control Group based on Knowledge, Skills and Attitudes.

	Pre (mean)	Post (mean)	Difference (mean)	Result
Knowledge	1.03	1.09	0.06	Low
Skills	1.01	1.02	0.01	Low
Attitudes	1.00	1.03	0.03	Low

The differences in mean scores show for these three aspects are presented in Table 2. All the changes are very small. The aspect of knowledge shows a mean value of 1.03 for pre-test and 1.09 for post-test. The difference of means is 0.06. Next, the overall aspect of skills shows a mean value of 1.01 for pre-test and 1.02 for post-test, with the difference of 0.01. Lastly, for the aspect of attitudes, the mean value is 1.00 and 1.03 for pre-test and post-test respectively. The difference of means is 0.02.

DISCUSSIONS, IMPLICATIONS AND SUGGESTIONS

Based on the analyzed data, it showed that competency-training workshop using *Self-concern Module* the instrument was very successful in improving facilitators' competencies in the aspects of Knowledge, Skills and Attitudes. Overall, based on the 10 units in *Self-concern Sexual education Module* among the three aspects measured, Knowledge aspect showed high mean value, followed by Skills aspect, which showed medium mean value, and but not least Attitudes aspect showed low mean value. The knowledge aspect got the high mean value because the facilitators received complete exposures of knowledge, information and details from the National Population and Family Development Board Malaysia [11] about sexual education based on *Self-concern Sexual Education Module* Facilitators who were equipped with a lot of information about sexual education can deliver it to the students and teenagers successfully. This study and other studies that measured the effectiveness of teachers in delivering sexual education showed the same results, which are, there are differences in facilitators' knowledge and understanding before and after getting training. Teachers' levels of understanding and knowledge about sexual and reproductive are higher after following the program.[12]

This study can give a huge impact to the sexual education in Malaysia especially towards schools and institutions, parents, teachers and society. Educators are the most worthy people to deliver sexual education to adolescents in schools after parents. Knowledge about sexual education covers sexuality, sexual transmitted diseases and skills to avoid unhealthy sexual behaviors. Teachers and counselors should be given the same kind of training so that they are equipped with knowledge and ready to teach students. Because there are teachers out there who still feel embarrassed to talk about this matter.

Next, institutions and schools play a crucial role in putting emphasis of sexual education on students at schools. To ensure society's harmony, schools and institutions cannot avoid this social obligation to educate children and teenagers about sexual education. Schools as formal institutions can standardize lessons that can be accepted by the students. Moreover, they have a group of well-trained teachers who have expertise in methods of information delivery. Thus, schools and institutions can provide systematic courses and training on sexual education so that teachers arewell trained.

Besides that, it is highly recommended that another facilitator competency training using *Self-concern Module*be delivered to teachers and counselors in schools, as teachers are the most important social agent in promoting and shaping teenagers' characters in schools. [13] This is because not all parents are able to educate their child at home. Therefore, teachers and counselors in schools should follow coaching training using *Self-concern Sexual Education Module* so that the content and information of sexual education can be adjusted to the teaching methods that have been used by them.

CONCLUSION

Overall, this study successfully trained facilitators in delivering sexual education to the students using *Self-concern Sexual Education Module.* This study found that the efficiency of facilitators in terms of Knowledge, Skills and Attitudes related to the sexual education increased after coaching training program using *Module* was given to them. Thus, it is expected that this study will give tremendous benefits and contributions to all parties and be one of the main reference in the field of sexual education in Malaysia.

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Multiple Regressions of a Malcolm Baldrige's Patient Safety Models

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ABSTRACT

This research proposed to develop patient safety models in primary health care and provide a possible model to implementated. Primary health care in Indonesia battling in assessment of risk reduction strategy because difficulty in identifying adverse event and there are no model or guidance for patient safety in primary health care yet. The patient safety model can be framed with Baldrige Health Care Criteria for performance excellence. Basic Emergency Obstetric Care was an critical health care in Indonesia for reduce maternal death by early detection of maternal complication. So, this study focus to develop patient safety model in basic emergency obstetric care bases on Baldrige criteria. We conducted a cross sectional study, data collected through a likert scale questionnaire from 194 respondent, there were doctors, nurses, midwifes, pharmacist, and medical report officer from six basic emergency obstetric care. Data analysis by linear regression and multiple regression to determined the most suitable variable to the models. The result shows that incident detection, mitigation, health workers workload and commitment, internal audit are variables for a patient safety model development. It is recommended to futher researcher to developed module for patient safety training in primary health care.

Keywords: patient safety, primary health care, Malcom Balridge, adverse event,

INTRODUCTION

Patient safety is a discipline that emphasizes safety in health care through prevention, reduction, reporting, and analyze of medical error that often leads to an adverse effect. Institue of Medicine (IOM) reported adverse event as 2,9 % and 6,6 % of the event are die. This made patient safety become as a central issue and new health care agenda in many countries.[1-3] Patient safety develops in hospital setting earlier. [4-6] But, concern for patient safety in primary health care start to growing in recent years.[7-8]

Based on IOM reported, the number for an adverse event in New York is 3,7% where 16,6% died. For the entire US, mortality due to adverse event among hospitalized patient amounting to 33,6 million per year In Indonesia. [2,9] Adverse event report on Medical Care and Nursing, Ministry of Health reached the 289 report until February 2016.[10] Adverse event cases in primary health care are 0.004 to 240 per 1,000 consultations.[11] The current study conducted in primary health care found that adverse event often related to administrative issues and documentation,[11,12] diagnoses of disease and drugs prescription,[13,14] cooperation and communication between health workers,[13,15,16] reporting and monitoring.[12,17]

Patient safety aspect appeared as part of the Health Minister Regulation number 75 of 2014 on Standards for Public Health Care (PHC) Accreditation of at the end of 2017 all health centers in Indonesia must have been accredited.[18,19] Readiness of public health care in the new health center reached 71% and service of non-communicable diseases has reached 79%. Only 24% of health centers who could implement all components of the diagnosis.[10]

Until now, the report of patient safety incidents in PHC and the health department has been not found, that made the lack of knowledge about the magnitude of the problems faced. But the news that appeared in the local newspaper about the malpractice incident shows that the problem of patient safety occured in PHC. This study aim to examine the dimensions of patient safety that is suitable for patient safety models in PHC.

METHOD

This study was quantitative using regression linear design. Research variable is patient safety and determinant variables are leadership, external policy, incident detection, mitigation, patient satisfaction, patient commitment, risk grading, Root Couse Analysis (RCA) and Failure Mode Evaluation Analysis (FMEA), health workers workload, health workers commitment and internal audit. Patient safety define as a system to make patient safety through risk assessment; assessment and identification related patient risk; reporting, analysis and action on the incident; and implementation to minimize injury. Research variables developed into indicators and measured through a questionnaire with Likert scale. The validity and reliability test had been done before on the questionnaire by testing to 30 respondent in another primary health center in other city with similarity. The result showed all the question has been asked are valid and reliable. The primary data collected through the questionnaire on 194 respondents. The sample size determined by a sample formula. The respondents are doctors, nurses, midwives, pharmacist, and medical record officers in 6 basic emergency obstetric cares (Lubuk Buaya, Seberang Padang, Pauh, Bungus, Air Dingin, Padang Pasir). Data processing through editing, coding, processing and cleaning procedures. Data analysis was done using a computer program to determine the frequency distribution of each variable, significant variable to patient safety and final model of patient safety.

RESULT

The result showed the respondent's average age is 37,91 years old (38 years), the youngest respondent was 20 years old and the oldest was 57 years old. The respondent's average long-working is 94,85 months or approximately 8 years.

Table 1: Charasteristk Informan

No.	Gender	f	%
1.	Male	7	3.6
2.	Female	187	96.4

From univariate analysis known that:

Table 2: Indicator of Patient Safety

No.	Variable	f	%
1.	**Leadership**		
	Not Good	94	48.5
	Good	100	51.5
2.	**Policy**		
	Not Good	95	49.0
	Good	99	51.0
3.	**Incident Detection**		
	Not Good	116	59.8
	Good	78	40.2
4.	**Mitigation**		
	Not Good	98	50.5
	Good	96	49.5
5.	**Patient Satisfaction**		
	Not Good	98	50.5
	Good	96	49.5
6.	**Patient Commitment**		
	Not Good	92	47.4
	Good	102	52.6
7.	**Health Workers Workload**		
	Not Good	84	43.3
	Good	110	56.7
8.	**Health Workers Commitment**		
	Not Good	95	49.0
	Good	99	51.0
9.	**Risk Grading**		
	Not Good	98	50.5
	Good	96	49.5
10.	**RCA and FMEA**		
	Not Good	97	50.0
	Good	97	50.0
11.	**Internal Audit**		
	Not Good	88	45.4
	Good	106	54.6
12.	**Patient Safety**		
	Not Good	98	50.5
	Good	96	49.5

Data analysis result showed all variables are significant to patient safety. This study using multivariate analysis to determine eligible variable to include in Patient Safet Model based on Malcolm Baldrige in basic emergency obstetric care. The multivariate analysis resulted there are some variable can be includedin

the regression model, there were: incident detection, mitigation, health workers workload, health workers commitment and internal audit.

The determinant coefficient shows value 0,591, that means the regression model can explain 5,91% variation of patient safety's dependent variable or the five independent variables can explain patient safety's variable as 5,91%. The statistic test result shows p value= 0.0001, means that regression model is fit with the existing data. Or it can be interpreted that the five variables can significantly predict patient safety in basic emergency obstetric care. From analysis result can determine a regression formula as follows:

> Patient Safety = 18.726 + 0.588Mitigation + 0.530 Health Workers Workload + 0.48 Health Workers Commitment - 0.29Detection + 0.168Audit

Based on statistic test, known that the most influence variable is mitigation (p-value = 0.002). Leadership, policy, patient satisfaction, patient commitment, risk grading, RCA and FMEA were excluded from the model because there no major changes (changed over 10%) for R square and Coef B. Incident detection variable was included in the model (p-value = 0.07) because Coef B and R- square (more than 10%) shows a changes when excluded from the model.

The excluded variables in the final model (leadership, policy, patient satisfaction, patient commitment, risk grading, RCA and FMEA) became confounding factors, that means the variables influences the relationship between independent and dependent variable.

DISCUSSION

The result shows that the respondent's average ages are 38 years old, this means, in general, the respondent in their productive period. Average long-working is 8 years, means, in general, respondent are experienced enough in their job and eligible become source of questionnaire data in this model development

Leadership: Leadership in the patient safety program has a no different role with leadership in the common organization. Leadership in basic emergency obstetric care shows a good result, this is because Head of Primary Health Care can influence and motivated the health workers to achieve the goal especially for patient safety in basic emergency obstetric care's goal. Increased in the

leadership of Primary Health Care Leader to influence and motivated the health workers toward patient safety, will increase patient safety application in basic emergency obstetric care.

This result is similar to Kunzle's research (2010) which stated that leadership has an important role in patient safety implementation. Kunzle stated that an effective leadership detect from a clear and not ambigiuous behavior which assimilated with current condition demand and shared among team members.[20] McFadden (2009) stated that leadership has a relationship with patient safety culture implementation.[21] Ginsburg et al (2010) stated that leadership is critical in support patient safety, especially in a small organization.[22]

Policy: The target policy is a policy that made by Head of Primary Health Care or Head of Health Department to regulate about patient safety implementation in basic emergency obstetric care. Based on field research, until now there is not found a policy in regulating patient safety in basic emergency obstetric care. Legal aspect or policy related patient safety is declared in Health Law No.36, 2009 clause 43, that patient safety is a process inside a hospital to give a more safety services to the patient. Indonesia started the patient safety campaign in 2005 by forming the hospital patient safety committee by Indonesia Hospital Association and launching the seven guidance in patient safety.

Incident Detection: Incident detection is critical in patient safety program implementation in basic emergency obstetric care. By detected the incident, the primary health care can do a mitigation action or prevention from that incident. Based on the explanation above, can be concluded that incident can happen because of various factor. So, incident detection performed not only for dominant factor but also others factor even for the small factor.

Mitigation: Patient safety mitigation is an effort to identify the all possible hazard that risking patient. Mitigation is designed to minimize and erase all possible hazards during patient care in healthcare. The low percentages of mitigation in primary health care for emergency obstetric complication because there is never a mitigation action related patient safety in their primary health care. This is also related to not guidance and policy yet about patient safety in primary health care for emergency obstetric complication

Patient Satisfaction: Patient satisfaction is an outcome from health care services. Patient satisfaction is one of impacted factor in increasing the quality of health care in basic emergency obstetric care. Patient satisfaction is patient feeling as result from health care that has been received in health care facilities after the patient compared with their expectation.[23]

Umaternata et.al research (2015) shows a significant relation between the right patient identification with patient satisfaction.[24]Health care services quality also have an important role in patient satisfaction in basic emergency obstetric care.[25]

Patient Commitment: Patient commitment defines as patient compliance and commitment in caring their health in basic emergency obstetric care. Patient safety can not be rise only with commitment and health workers effort but required patient support and cooperation. A good patient commitment will increase the patient safety implementation and help the patient's curing and rehabilitation.

High patient commitment will increase patient loyalty. Patient commitment has a great influence in the mediation of the relationship between patient trusts toward patient loyalty.

Health workers commitment in Indonesia still low. This is will lead a lot of harm such as, increased in organization expenses and suspended of patient health care. Will give a negative impact on patient satisfaction, health workers safety and patient safety itself. The low health workers commitment will increase the possibility of work accident, infection and the adverse event.

Health workers commitment defines as trusting level, individual attachment toward goal and having desire to still in the organization. Based on this research shows that health workers with lack of commitment will result lack of patient safety. So that was critical to strengthen work commitment for each of health workers.

Internal Audit: There were a strong relationship and positive pattern between internal audits with patient safety in basic emergency obstetric care. The more good the internal audit will increase a good patient safety too. The audit is a systematic process, independent and well documented to get a prove of audit and assess objectively to determine how far the audit criteria have been achieved. Primary health care audit is held by primary health care auditor, from the staff or head of primary health care for primary health care needs.

CONCLUSION

Our study has identified that detection an incident, mitigation, staff workload, and commitment, also internal audit as the construct for patient safety model in primary care. It is recommended that further research is taken to developed module from the models for training patient safety in primary care.

Conflict of Interest: There is no conflicts of interest

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Study on Utilization of Free Neonatal Services Under Janani Shishu Suraksha Karyakram at Government Health Facilities in Haldwani Block, District Nainital, Uttarakhand

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ABSTRACT

Introduction: Considering the fact that almost all childhood mortality & morbidity in India is preventable, the Government of India is making numerous efforts to reduce neonatal mortality. So far, several initiatives have been undertaken in India to achieve this objective. Janani Shishu Suraksha Karyakram (JSSK) is a recent initiative towards this end which was launched on 1st June 2011.Under JSSK, free entitlements have been put in place for pregnant women & sick neonates up to 30 days of age.

Objective: To assess the utilization of free neonatal services under JSSK by study subjects and to assess out of pocket expenditure incurred on utilization of various services for neonates.

Methodology: A cross sectional observational study was conducted in Haldwani block of District Nainital. Samples were collected from 30 clusters/villages using simple random sampling. Data was collected using a pre-designed, semi-structured questionnaire and analyzed by using SPSS version 21.

Results: Regarding the utilization of free neonatal government services, Majority (62.5%) availed free diagnostic services. However only 37.9% neonates availed free drugs & equal number were exempted from user charges for OPD. Only 3.4% availed free referral transport from home to facility while none of them availed drop back referral transport. The median OOP expenditure on drugs, diagnostics, user charges on OPD and transport was Rs. 200, 100, 15 and 40 respectively in case of neonates.

Conclusion: The utilization of free neonatal services under JSSK was found to be low in our study; lowest utilization being of referral transport service while maximum expenditure was incurred on drugs.

Keywords: JSSK ; free entitlements ; neonatal mortality

INTRODUCTION

The infants constitute about 2.92% of the total population in India. From the time of birth, 20-30% of babies are underweight which makes them vulnerable to infection & disease[1].Since neonatal deaths contributes to 57% of the under five deaths in India, hence improving newborn health is critical for improving child survival [2].Amongst the highest priorities on India's national health agenda is achievement of millennium development goal 4, that is, reducing mortality among children aged <5 years by two-thirds between 1990 and 2015[3].

In India, the infant mortality rate per 1000 live birth was 41.4 accounting for 1,053,387 infant deaths in the year 2013. Also, neonatal mortality per 1000 live birth was 29.2 accounting for 747,544 neonatal deaths in the year 2013[4].

Considering the fact that almost all childhood mortality & morbidity in India is preventable, the Government of India is making numerous efforts to reduce neonatal mortality[5].So far, several initiatives

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have been undertaken in India to achieve this objective. Janani Shishu Suraksha Karyakram (JSSK) is a recent initiative towards this end which was launched on 1st June 2011.Under JSSK, free entitlements have been put in place for pregnant women & sick neonates up to 30 days of age[6]. Recently, the age limit for child for provision of free entitlements has been extended up to 1 year of age[7].

There have been few studies regarding JSSK so far since its launch. Since no study regarding JSSK has been conducted in Haldwani block so far, so the present study is conducted, to identify the implementation status of JSSK according to its stated objectives in terms of neonatal services up to 30 days of age.

MATERIAL METHOD

The present study was a cross sectional observational study conducted in Haldwani block of district Nainital in the state of Uttarakhand for a period of one year from September 2015 to August 2016.

Study subjects: The study subjects were infants of age between 30 days to 1 year born to females who delivered in the last one year from date of assessment at government health facilities in Haldwani block of District Nainital.

Sample Size: Assuming 50% utilization of all components of JSSK, 10% absolute error & 95% confidence interval, the sample size came out to be 100 using the formula Z^2 p q/d^2 .Taking design effect of 2 for cluster sampling & 5% non response rate, the final sample size came out to be 210.

Sampling Technique: Two stage sampling technique was used taking village as primary sampling unit. In Haldwani block there are 252 villages or clusters, list of which was obtained from the tehsil. Out of these, 30 villages or clusters were selected randomly. From each selected village or cluster, seven eligible infants were included in the study to complete the sample size of 210.

A list of eligible infants was identified from ASHA of that village or the village Anganwadi centre from the record of females who delivered at government health facilities in the last one year from date of assessment. Out of all those identified, seven eligible infants were selected using the lottery method. The houses of these selected infants were then visited & information was collected through their mother's interview directly.

Data Collection: Data was collected by means of a pre-designed, semi-structured questionnaire. The questionnaire consisted of details about sickness of eligible infants during the neonatal period and utilization of OPD, diagnostic, drugs, blood & transport services during treatment of illnesses along with expenditure incurred on various services, if any. Descriptive interpretation of data was done in the form of percentages & expenditure incurred was calculated in the form of median.

Data Analysis: Data was entered in Microsoft Excel and analyzed using SPSS software version 21 for windows.

RESULTS

The present study assessed the utilization of free services under JSSK for neonates up to 30 days of age.

Forty infants out of 210 (19%) fell sick during first 30 days of life .Out of those 40 neonates, 29(72.5%) availed services from government hospital and 11(27.5%) availed services from private hospital. Also, 7 neonates (17.5%) were hospitalized in Neonatal intensive care unit (NICU) at Government hospital. (TABLE 1)

Table 1: Place of availing treatment for sick neonates by study subjects and number of sick neonates hospitalized (n=40)

Place of treatment	Sick neonates who availed treatment		Sick neonates who were hospitalized	
	Number	Percentage	Number	Percentage
Government hospital	29	72.5	7	17.5
Private Hospital	11	27.5	1	2.5

Out of 29 neonates who availed services at government health facility, 11(37.9%) were provided free drugs from health facility itself and 11(37.9%) paid

no user charge for OPD. Out of 8 neonates who required diagnostic services, 5(62.5%) availed free diagnostic service from government health facility & rest got it done

from private facility to get report early. Only 1(3.4%) availed free transport from home to facility. None of the neonates availed in between referral transport and drop back home transport facility owing to the unawareness of caretaker & also because the referral transport was not provided to them at respective health facility (TABLE 2).

Table 2: Distribution of neonates according to utilization of free entitlements under JSSK

Entitlements	No. of eligible infants	No. who availed services	
		Number	Percentage
Free drugs	29	11	37.9
Free Diagnostics	8	5	62.5
No user charge for OPD	29	11	37.9
Free Transport from home to facility	29	1	3.4
Free in between referral transport facility	1	0	0
Free drop back to home transport	29	0	0

Expenditure was incurred in case of 62.1% neonates on drugs, in case of 37.5% neonates on diagnostics, in case of 62.1% neonates on user charges on OPD, & in case of 51.7% neonates on transport either way. Median expenditure on drugs, diagnostics, user charges on OPD, & transport was (in Rs.) 200,100, 15 & 40 respectively (FIG 1)
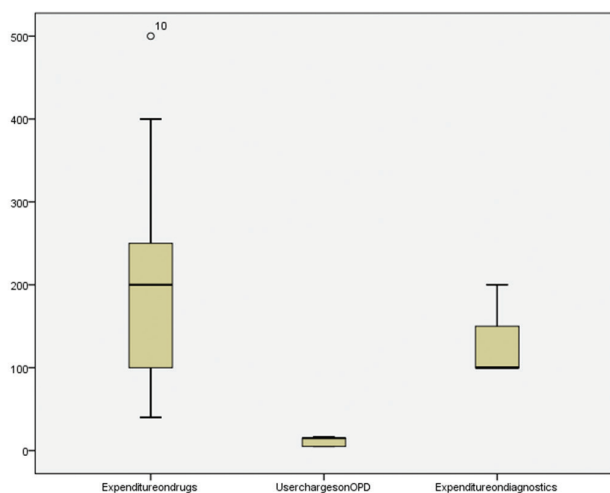
Fig. 1: Box Plot depicting average expenditure (in Rupees) incurred by study subjects on neonatal health

DISCUSSION

Our study described the utilization of neonatal component under JSSK up to 30 days of age along with expenditure incurred on various services.

It was found that 19% of the neonates fell sick during first 30 days of life. Out of this, 72.5% availed neonatal services from government health facility & rest from private health facility. Out of those who availed services from government facility, 37.9% utilized free drug services, 62.5% utilized free diagnostic services, and 37.9% incurred no user charge for OPD or admission. These findings reveal that despite of the guidelines on JSSK clearly stating about zero expense treatment of sick neonate at government health facility, expenditure is being incurred on drugs, diagnostics & user charges. Only 1 beneficiary (3.4%) utilized free referral transport from home to health institution while none of them utilized in between free referral transport & drop back transport service. It was found that majority of study subjects were unaware about referral transport service for neonates & also none of the treating health facility offered them one. Goyal R. C. et al[8] also reported that no sick newborns availed free referral transport services to drop back home; Public Health Resource Society[9] also reported that out of all sick neonates, the family of only one called for government vehicle.

In our study, out of pocket expenditure overall was incurred on 72.4% neonates. Public Health Resource Society[9] reported that out of 12 sick neonates who were taken to a public health facility, more than half of the respondents incurred OOP. Similar finding is evident from our study.

Out of pocket expenditure on neonatal health was found to be 200 Rs. for drugs, 100 Rs. for diagnostics, 15 Rs. for user charges on OPD & 40 Rs. on transport. Median expenditure on neonatal health was found to be 200 Rs. in our study. Public Health Resource society[9] reported median expenditure amounting to Rs. 300 on neonatal health. Although this is high as compared to the findings in our study, however both these findings clearly indicate that despite for provision of free services under JSSK for neonates, some expenditure is being incurred either on OPD slip, drugs, diagnostics or transport for one reason or another.

CONCLUSION

The utilization of free neonatal services under JSSK was found to be low in our study; lowest utilization being

of referral transport service. Out of pocket expenditure was incurred on all the services & maximum expenditure was incurred on drugs.

Conflict of Interest: None declared

Source of Funding: None

Ethical Approval: Ethical approval was taken from institutional ethical committee of Government Medical College, Haldwani

Recommendations: It is recommended that there should be provision of clear guidelines to all government facilities regarding provision of free entitlements to neonates. The community should be made aware regarding availability of various free services to neonates at government health facility through IEC material which should especially be displayed at government health facility.

Limitations of the study: Although the JSSK neonatal service component has been extended up to sick infant, the present study has covered up to 30 days neonatal services only.

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Promoting Healthy and Eco-Friendly School Through Students' Participation

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ABSTRACT

Facilities to ensure health and learning skills for children is essential of an effective education system. Safety, supportive environment, sanitation, hygiene and nutrition are the basis to make school environment healthy. Healthy lifestyle includes adequate physical activity, harmony in life and prevention of unhealthy practices. A qualitative study has been conducted to understand the difficulties in following healthy practices in schools through participation of students. There are ten government high schools at Balasore town, Odisha. Ninth standard students from four government schools of Balasore district of Odisha formed the study sample. Participatory discussion and observation methods were used to conduct the study. Students provided their views on various health and environmental indicators such as physical activities, school environment, waste management at school, availability of facilities like safe drinking water, toilets, play grounds etc. in school, and habits of children related to choice of junk foods, tobacco use, etc. Study found inadequate healthy practices among children and lack of availability of facilities supporting health promotion and eco-friendly environment in school. Current study is process oriented which may be applied to make students understand the connection between health and environment and participate in decision making to make school campus healthy and environment friendly.

Keywords: *School environment, Behaviour, School infrastructure, health, hygiene and sanitation*

INTRODUCTION

World Health Organisation specifies the importance of improving the physical environment at school as children are more vulnerable to adverse environmental conditions than adults.

> *'.....Between 25% to 33% of global burden of disease can be attributed to environment risk factor '[1]*

Transformation of school environment from an unhygienic, unclean, unsafe, congested and unhealthy place to a hygienic, clean, safe, flexible and healthy place turn attitude of students, teachers and community towards positive thinking and action which affect teaching and learning positively[2]. National school sanitation manual highlighted the need for promotion of personal hygiene and environmental sanitation as there are many schools with lack of safe hygiene facilities, and also lack in providing safe drinking water to students.

School level health and environmental education and facilities are essential to make children and adolescence adopt good habits[3].

Along with sanitation, hygiene and infrastructural facilities, adequate exposure to natural environment is also essential. During childhood, one develops lifelong habits and connection with nature during this time makes child aware of the importance of natural environment and also the essentiality of protecting environment[4]. Exposure to greenspace has positive impact on overall wellbeing of individuals and also enhance their ability to focus[5].

Existing schools which established decades ago need to reflect sustainability characteristics of various available infrastructures and various practices addressing contemporary social, economic, cultural and environmental requirements. Each school need to find out its needs at school level to adopt flexible ways to

make school healthy and eco-friendly. While diagnosing the issues of school; location, functionality of school spaces, comfort, health hazards, water supply and consumption, safety, energy efficiency, environmental impacts, participation of stakeholders etc must be taken into consideration[6]. Students need to be involved in problem identification, visioning and planning phase[7]. Kaplan and Lewis recommended that recognition of students' opinion on various educational experiences were vital for making school sustainable[8]. Convention on the Rights of Child in article 12 also states that children have the right to participate in decision making processes relevant in their lives within family, in the school and in the community[9].

Center for Environment Education under the Ministry of environment, forestry and climate change is implementing the United Nations conference on environment and development's (1992) eco-school programme in India. Its main goals are democratic and participatory student led programme, making students environment friendly and facilitating hands on learning[10]. Considering the growing need to make schools healthy and environment friendly on one hand and importance of making students participate in the developmental process on the other hand, this study has used participatory approach to involve students in discussion about the modifications required in their schools and to make them realise their rights and duties.

OBJECTIVES

- To examine views of students on resources/facilities affecting health and environment at school

- To priorities the issues affecting school health and environment with the participation of students

METHODOLOGY

This study adopted qualitative techniques to know the availability of facilities such as toilet, drinking water, waste disposal system, clean surrounding, safe consumption and playground, etc. from the point of view of high school students. The study is not about generalizing the findings but to develop process of involving students in decision making. There are ten government high schools in Balasore municipality of Odisha state. Randomly four schools were chosen for the study and ninth standard students were asked

to participate voluntarily to discuss about the school environment and practices. Total one hundred and nineteen students (119) from four schools (School 1: (35), School 2:(32), School 3: (28) and School 4: (24)) participated in the study. Participatory activity was conducted to capture students' view as well as to make them aware about the eco-school concept.

The participatory approach involved

- Facilitating discussion in small groups about the indicators of ecofriendly and healthy school environment

- Listing out the majorly discussed indicators by researcher

- Making students discuss the position of their schools on the basis of various indicators mentioned by them.

- Discussion with students on the rights and duties of various stakeholders such as students, teachers, community, district authorities with regard to improve school environment to make it healthy and eco-friendly

ANALYSIS AND DISCUSSION

School environment influences students' knowledge, attitude, behaviour, and habits to a great extent. School environment includes facilities inside and also surrounding of the school. There are some common factors such as waste disposal, water use, pollution, sanitation, consumption habits, etc influence both health and environment. Hence, a health promoting school must be environment friendly as well as unhealthy habits lead to environment degradation. With this basic ideas, students were asked to form groups with five to six members in each group and facilitated to discuss the factors responsible for a healthy and eco-friendly environment. Students came up with different ideas such as

- Classroom facilities like light, ventilation, space, cleanliness and availability of dustbin

- Separate and clean toilet and urinals for boys and girls

- Drinking water facility in the school

- Checking of water wastage due to damaged water taps

- Clean surrounding and proper waste disposal

- Controlled use of plastic and non-biodegradable materials in school

- Playground to play

- Garden and trees in the school compound

- Consumption habits of students
- Behaviour of students and teachers with respect to managing resources at school

The discussed points were compiled and opinion of students about the position of their school, based on the benchmark developed by them, was recorded. Each area is discussed school wise. The discussed areas are important as these are the felt need of the students.
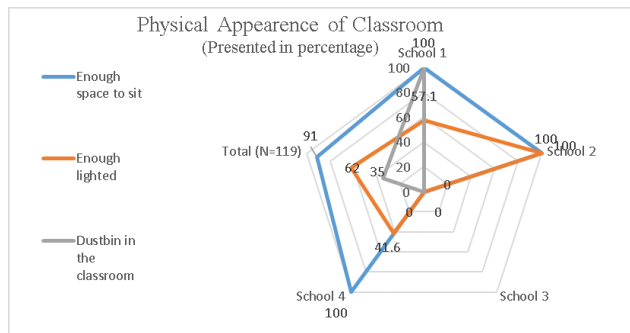
Chart: 1

Overall 91% students felt that they had enough space to sit in their classrooms and 62% students were satisfied with the lighting facility in their classrooms. In school 3, students were very dissatisfied with regard to space in the classroom and lighting facilities. Classroom size should be adequate to provide space to students to talk, listen, read, write, play and participate in learning. Further they pointed out that extremes of light, temperature, air quality, noise and crowd affect the learning process negatively[11]. Safety and comfort affect both learning and personal development and is affected by psychological environment which refers to social equality and physical environment of school such as proper space, lighting, ventilation, air quality etc[12]. Evenly diffusion of light in the classroom is also essential[13].
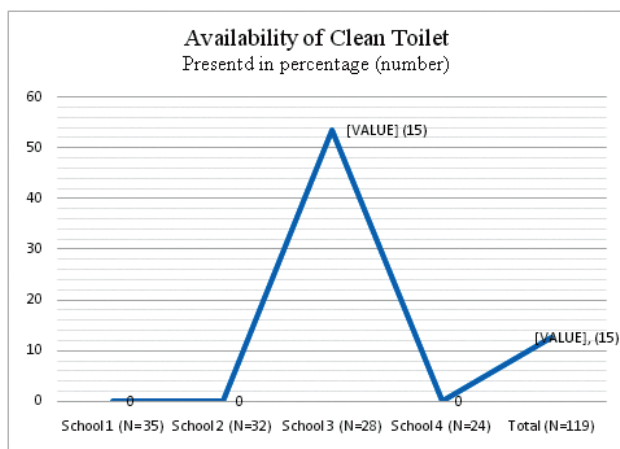
Chart: 2

School productivity is correlated with cleanliness and sanitary facilities[2]. Availability of toilet facility comes under basic sanitation concerns. It is also essential to follow better sanitation practices. Both open defecation and avoidance of toilet use have adverse effect on health of children. An article in 'Nursing times' had discussed about the constipation which is a contributory factor of urinary infection among children occur due to the avoidance of use of toilet[14]. Only 12.6% students have access to toilet. Students from all schools expressed discontent of not having toilets and specifically of not having separate toilet areas for boys and girls. Students in School 1 shared that they have never used the toilet and they used to wait till they reach home after school to release themselves. In school-3 toilet facility is there only for girl students which is not adequate for the number of girl students in the school. Not only for health, are toilets necessary to practice healthy habit. When basic toilet facility is not there, availability of hand washing liquid and water is a far dream for these students.
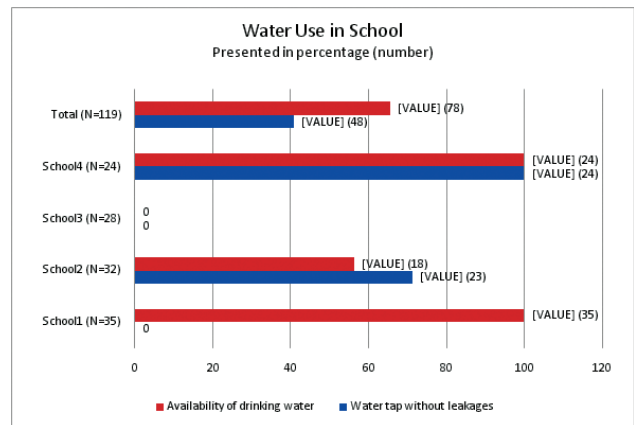
Chart: 3

Chart 3 presents both availability of drinking water and water wastage due to leakages in water taps. The reason behind discussing both the issues together is to highlight the interrelation between water waste and water scarcity. 'Water wise' writes, 'a dripping tap can waste 20,000 liters of water a year'[15]. Once water is wasted, it is expensive to treat water and to make it consumable. On the other hand unavailability of drinking water increases the chance of consumption of contaminated water. Hence, children are prone to health risk whether they chooses to drink unfiltered water or not to drink water.

All the students in school 1 and school 3) and 28.9% students in school 2 (total 59.7% students) shared that water taps are leaking in their schools. On the other hand

34.5% students are not satisfied with the drinking water facilities at their schools.

Regular monitoring of water taps is necessary to check water wastage. Promotion of both safe water drinking habits and water saving practices in the school may help students to inculcate such behaviour in their personal lives also.
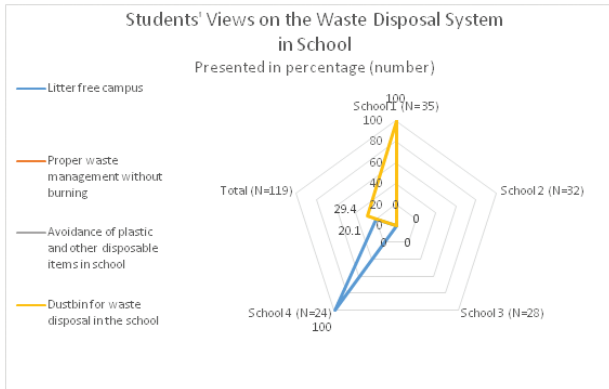
Chart: 4

School campus cleanliness is linked with job stress of educators and learning of students[16]. The above chart shows poor waste management in schools. Only in school 4, all students opined that their school campus is clean and litter free and only school 1 has one dustbin in the campus to dispose waste. Burning waste is dangerous as it causes air pollution and increases the respiratory health risk among the people around. In school 3, people staying around the school are irresponsibly using the school campus to dispose their household waste (as shared by students). Although all these schools are in municipality area, they prefer burning waste to keep their campus litter free. Municipality waste collection vehicle is collecting waste from those areas but there is no proper coordination between schools and municipality to manage waste in the best possible way.

None of the schools are avoiding the use of plastic and other non-biodegradable items in the school campus. Schools can reduce the waste by avoiding disposable items and adopting reusable and eco-friendly items during observation days as well as in day to day activity.

Chaos environment has negative effect on children's problem behaviour[17]. For sustaining cleanliness habits among students, schools need to provide infrastructure and experiences of clean surrounding.
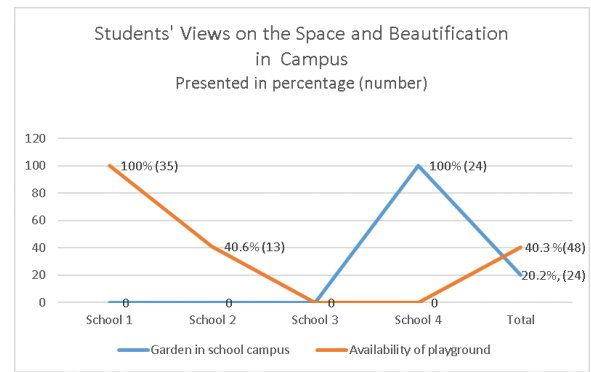
Chart: 5

Chart 4 discusses the opinion of students about the availability of play ground and gardens in their schools. Non-availability of equipment and space such as playground, park etc are considered as barriers in participation in physical activities[18]. Williams & Dixon (2013) by synthesizing empirical researches done in last two decades (from 1990 to 2010), found that majority of the researches reported positive effect of garden based learning on children's direct (subject specific learning) and indirect (Social development) learning outcomes[19].

'....*For children, the playground is a major vehicle for learning and development...*' – (Parnell & Ketterson, 1980)[20]

Only in school 1, all the students were satisfied with the space they have in to play in the school. However, one third of the playground is being used for parking bicycles. Again only in school 4, students were happily expressed of having garden in school campus. Students of school 4 praised their headmaster for initiating and maintaining garden in the school. Involvement of teachers and head of the institution in keeping campus green and clean is vital. At the same time students may be involved in gardening activities to experience the natural environment because interaction with natural environment make children environmental sensitive and responsible[21].
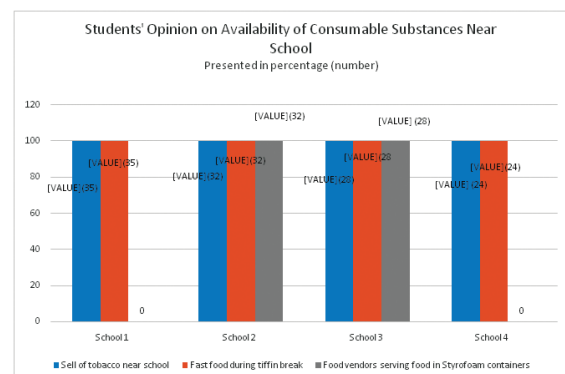
Chart: 6

Physical activities and healthy eating are essential for good academic performance[22]. Schools along with home and community, are responsible to provide favorable environment to students for regular physical activities and healthy eating practices.

Students of all the school revealed the use of tobacco product by school students. There are shops near schools, selling tobacco products to school students. This violets section 6 (a & b) of the Cigarettes and other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply and Distribution) Act, 2003 which directs prohibition of sell of Tobacco product in an area within the radius of one hundred yards of any educational institution[23].

All the schools allow fast food during tiffin break and students consume those food items served in Styrofoam plates and bowls which is not only harmful for their health but also creates non-recyclable and non-compostable waste in the school campus.

Students must be allowed to make informed choice by making them aware about effect of their food and product choice on their health and environment. The report 'School health guidelines to promote healthy eating and physical activity' prepared by Division of adolescent and school health, National Center from chronic disease prevention and health promotion has recommended coordinated school health programme where school, community, parents, teacher, business etc will take responsibility consciously to promote healthy schools in America[22]. Such steps may be applicable in Indian scenario where it is difficult for teachers and students to build a good environment without the support of area authorities, parents and community.

CONCLUSION

Based on the position of schools on the eco-friendly and healthy indicators, students prioritized the issues in their respective schools and discussed about their rights to experience healthy school environment and duties to maintain the school environment in healthy and eco-friendly manner. Separate toilet facility, proper waste management by avoiding waste burning, use of reusable and sustainable materials in schools and refusal of disposable items, inculcating healthy eating habits, and proper monitoring of sell of tobacco near schools as well as self-control to avoid tobacco consumption were prioritized as most important action to be taken immediately. Students found their roles vital in taking action with regard to maintain healthy and eco-friendly schools. Hence, involving students in the decision making process helps to make them realise both right and duties and enable them to find the way-outs for various challenges around them.

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Usefulness of Serum Total PSA Value in Screening of Various Prostratic Diseases

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ABSTRACT

Background: Prostate cancer is one of the common malignancy in males in India. Prostate Specific Antigen (PSA) is currently the best screening modality available for the detection of prostrate carcinoma.

Aims & Objective: To determine the correlation of total PSA levels in different Prostatic lesions.

Materials & Method: This prospective analytical study was conducted over a period of one year (June 2015 to May2016) in the department of Pathology, SMS&R Greater Noida. Total PSA estimation was done in all prostratic lesions immunometrically on Vitros ECi system.

Results: All cases of adenocarcinoma showed total PSA ranging from 54.1-94.1 ng/ml except one which exhibited normal level of PSA of 5.6 ng/ml. There was one case of urothelial carcinoma which showed low serum PSA level of 2.4 ng/ml. In HGPIN total PSA level ranged from 45.4-58.6 ng/ml while in LG PIN PSA varied from 9.2-17.1 ng/ml. In non-neoplastic lesions it ranged from 3.76-6.62 ng/ml and it showed increase with an increase age.

Conclusion: The total PSA level of more than 54 ng/ml is highly suggestive of malignancy while 45-50 ng/ml were suggestive of HGPIN. Such cases should be thoroughly searched for malignancy.

Keywords: *prostate specific antigen, prostate cancer, screening, immunometric assay*

INTRODUCTION

Prostrate specific antigen (PSA) is currently the best screening modality available for the detection of prostrate carcinoma.[1,2] In addition to prostate cancer, a number of benign and pre neoplastic conditions (PIN) also cause PSA level to rise. The most frequent benign prostate conditions that cause an elevation in PSA level are Benign prostatic hyperplasia, Prostatitis, Prostatic trauma and Prostatic infarction.[3-5] The present study was undertaken in the patients in which prostatic biopsies were performed in the department of Surgery and was submitted to the Pathology department of SMS&R, Greater Noida. Total PSA was performed prior to surgery and the results were interpreted in connection to histopathological diagnosis which was rendered on prostatic biopsies.

MATERIALS AND METHOD

Study Design: Prospective Analytical Study

Sample size: 100 cases

Inclusion Criteria:
- All the patients in which histopathological specimen was submitted to the department of Pathology SMS&R were included in the study.
- A detail clinical history and physical examination was taken in each case.

Exclusion Criteria:
- Patients in which histopathological diagnosis was not given in our institute.
- Patients who did not gave consent for biopsy.

The study was performed within the guidelines of Institutional Ethics Committee.

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A total of 108 cases who underwent prostratic surgery were included in the study. The age ranged from 45-94 years. The mean age was 64.5 years. The detailed history including the age, occupation, socioeconomic status, dietary history, residence and drug history was taken and physical examination was conducted. After informed consent, all patients were subjected to serum t-PSA level estimation. The t- PSA of all the cases and 100 controls were done immunometrically on Vitros ECi immunodiagnostic system and the values obtained were recorded. Following which prostratic surgery was performed. One hundred eight patients underwent surgical procedures for prostate and specimens were obtained in the department of Pathology. The specimens were in 10% formal saline. These included transurethral resection of prostate (TURP) specimens, prostatectomy and core needle biopsies. The histopathological diagnosis was given on H&E.

Figure 2: Benign prostatic hyperplasia. (H&E;40X)

RESULTS

Out of 108 cases which were subjected to histopathological examination there were 73 cases of BPH, 14 cases of BPH with prostatitis, 2 cases of BPH with granulomatous prostatitis and one case of prostate abscess. There were 10 cases of premalignant lesions (6 cases of LG PIN, 3 cases of HG PIN, 1 case of AAH) and 8 cases of malignancy (7 cases acinar adenocarcinoma and one case transitional cell carcinoma). The serum t-PSA values in controls (n=100) ranged from 2.6-4.3ng/ml. There was increase in PSA levels upto 74 years followed by mild decrease till 84 years and again further rise in 84-89 years age interval. In prostratic abscess the PSA on average was 16ng/ml. In BPH it ranged from 3.7-6.6 ng/ml and it also showed increase with an increase age. In LGPIN ranged from 9.2-17.1 ng/ml and there was no correlation with age. In HGPIN ranged from 45.4-58.6 ng/ml. In all cases of adenocarcinoma the PSA ranged from 54.1-94.1 ng/ml except one which exhibited normal level of PSA of 5.6 ng/ml. The case of urothelial carcinoma showed low serum PSA level of 2.4 ng/ml.

Figure 3: HGPIN showing stratification and prominent nucleoli in HGPIN(H&E,100X)

Figure 1: Granulomatous prostatitis showing granulomas with giant cells. (H&E;40X)
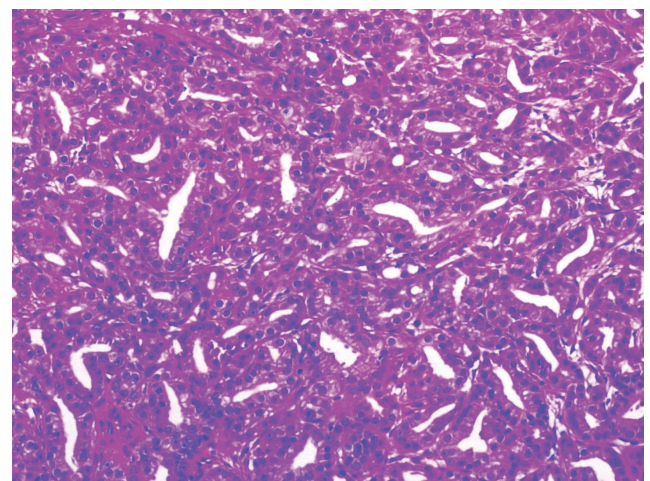
Figure 4: Adenocarcinoma prostate showing glands formation (Gleason's grade 4+3)   (H&E; 40X)

Table No.1: Age wise distribution of prostatic lesions given histopathology

Age (years)	Non Neoplastic				Pre Neoplastic			Neoplastic
	BPH	BPH with prostatitis	BPH with granulomatous prostatitis	Prostrate Abscess	AAH	LGPIN	HGPIN	
45-54	12	2	0	2	0	1	0	3
55-64	20	4	0	0	0	1	0	1
65-74	29	6	0	0	1	2	1	3
75-84	09	2	1	0	0	2	1	2
85-94	03	0	0	0	0	0	0	0
Total	90				1	6	2	9

Table No. 2: Mean serum t-PSA levels (ng/ml) in each class interval in various in the prostatic lesions and control subjects

Age (years)	Controls	BPH	BPH with prostatitis	BPH with granulomatous prostatitis	Prostrate abscess	AAH	LG-PIN	HG-PIN	Prostatic Carcinoma
45-54	2.64	3.76	8.38	-	16.00	-	17.1	-	94.1
55-64	2.98	4.95	8.63	-	-	-	9.2	-	5.6
65-74	4.35	5.16	14.07	-	-	6.02	9.9	58.6	74.1
75-84	3.32	6.62	14.14	14.20	-	-	9.2	45.4	81.2
85-94	4.31	5.17	-	-	-	-	-	-	-

Total PSA in control subjects showed age related increase from age interval of 45-54 to 85-94 age interval and the values varied from 2.64-4.31 ng/ml. The mean serum t- PSA in BPH cases showed marginal increase in different age intervals as compared to controls. The values of PSA were above normal limit from 6th decade onwards. In prostatitis it ranged from 8.58 to 14.14ng/ml. It was much higher in control. LGPIN showed PSA levels of 9.2-17.1 ng/ml. HGPIN was moderately increased total PSA ranging from 45.4-58.6 ng/ml. PSA levels of were markedly high in carcinomas except one case which exhibited normal levels.

DISCUSSION

Prostrate specific antigen (PSA), a serine protease glycoprotein, is produced in the epithelial cells of the prostate. It is present in the serum only if there is disruption of this epithelium; which leads to the crossing of PSA into the extracellular space, where it is swept away by lymph in the systemic circulation. [4] In controls PSA ranged from 2.6-4.31 ng/ml. There was increase in PSA levels upto 74 years followed by mild decrease till 84 years and again further rise in 84-89 years age interval. There

were 2 cases of prostratic abscess of 48 and 51 years in which average PSA was 16 ng/ml. In cases of BPH it ranged from 3.76-6.62 ng/ml and it exhibited increase with an increase age. In LG PIN PSA varied from 9.2-17.1 ng/ml while it was higher in HGPIN ranging from 45.4-58.6 ng/ml. There was no correlation to age. One case with PSA level of 100 ng/ml was given a diagnosis of HGPIN on core biopsy specimen but on subsequent prostatectomy specimen it was diagnosed as prostratic adenocarcinoma. In all cases of adenocarcinoma the PSA ranged from 54.1-94.1 ng/ml except one which exhibited normal level of PSA of 5.6 ng/ml. There was one case of urothelial carcinoma which showed low serum PSA level of 2.4 ng/ml. There was increase in PSA levels upto 74 years followed by mild decrease till 84 years and again further rise in 84-89 years. In the study by Wadgaonkar et al 40.3% of the benign cases had serum PSA < 4 ng/ml. 22.4% benign cases had modest elevation in serum PSA, in the range of 4.1-8 ng/ml and 17.9% had serum PSA in the range of 8.1-12 ng/ml. 9% of benign cases had severely elevated serum PSA with value more than 20 ng/ml, probably due to associated conditions like chronic prostatitis, granulomatous prostatitis. [6] In our study the mean PSA in cases associated with prostatitis was from

8.58 to 14.14ng/ml in different age interval which was much higher than the control values. According to a study by Nadler et al, acute and chronic inflammation of prostate is more commonly associated with high serum PSA. [7] Kiehl and associates in their study also concluded that BPH and prostatitis is associated with PSA elevation when glandular epithelium is disrupted. [8] Stamey et al, found 68% of patients with BPH with PSA > 4.0ng/ml. [9] In present study we got about 59.7% of patients with elevated serum PSA (> 4.0ng/ml). In the study by Wadgaonkar et al, 66.7% malignant cases had severely elevated serum PSA levels more than 20 ng/ml. 16.7% malignant cases had serum PSA in range of 12.1-16 ng/ml. [5]

Narayan et al, found 24% of prostate adenocarcinoma patients with serum PSA >20 ng/ml. [10]   In a study by Lekili et al, (1994), 8 out of 25 (32%) prostate adenocarcinoma patients had serum PSA value >20ng/ml. [11] Slaoana in his study stated that there is high positive correlation between the values of PSA in serum and the degree of tumor differentiation determined by Gleason's system, as well as the low correlation between PSA and histological differentiation estimated using classical system from 1 to 3. [12]

Conclusion: The total PSA level of more than 54 ng/ml is highly suggestive of malignancy while 45- 50 ng/ml were suggestive of HGPIN. Such cases should be thoroughly searched for malignancy.

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Diabetes Mellitus, ADL Disability and Nutrition Intake: Determination Factors of Severe Sarcopenia among Elderly in Urban Nursing Homes

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ABSTRACT

Background: Since the EWGSOP consensus was established, researchers were easier to create a 'global map' of sarcopenia, which revealed prevalence ranging from 5 to 33% in the various regions. Sarcopenia appears to be an age-related phenomenon, exacerbated, by a sedentary lifestyle, nutritional factors, and chronic disease. The objective of this study was to determine the relationship of sarcopenia and multiple factors in elderly.

Methods: This was a cross-sectional study of 138 subjects aged ≥ 60 years who were recruited from four nursing homes in West Jakarta. Sarcopenia was measured by means of the bioelectrical impedance. The procedures for the measurement of blood pressure were adapted from JNC 7. All subjects underwent a standardized structural clinical evaluation along with routine blood tests. Chi Square and multinomial logistic regression tests were used to find relations between the sarcopenia and the multiple risk factors.

Findings: The percentages of subjects with mild sarcopenia, severe sarcopenia, non-sarcopenia were 50.7%, 8.0% and 41.3% respectively. After adjusting for confounding factors, gender (OR =12.81, 95% CI: 1.50-109.33), diabetes mellitus (OR= 4.10, 95% CI: 1.04-16.14), ADL-disability (OR= 4.18, 95% CI: 1.07-16.26), carbohydrate and energy intake (OR= 4.43, 95% CI: 1.11-17.71) (OR= 3.87, 95% CI: 1.01-15.28) were associated with sarcopenia, especially severe sarcopenia.

Conclusion: Sarcopenia is highly prevalent among elderly living in urban nursing homes, 58.7% and 8% who were categorized as having severe sarcopenia. Sarcopenia, especially severe sarcopenia influenced by multiple risk factors such as gender, diabetes mellitus, ADL disability and nutrition intake, mainly for carbohydrate and energy intake.

***Keywords:** Sarcopenia, risk factors, nursing home, elderly*

INTRODUCTION

Sarcopenia is believed to be a part of the aging process.[1] In 2010, the European Working Group on Sarcopenia in Older People (EWGSOP) proposed the new definition for sarcopenia as a syndrome characterized by the progressive and generalized loss of skeletal muscle mass associated with loss of strength and/or function. Since the EWGSOP consensus was established, studies have become more comparable, allowing researchers to create a 'global map' of sarcopenia, which has revealed prevalence ranging from 5 to 33% in the various regions evaluated.[2]

Recent population trends indicate an alarming rise in the prevalence of obesity among older adults and it potentially adding a complementary condition that compounds the risk of poor health outcomes.[3] Aging is associated with important changes in body composition and metabolism.[4,5] Between the age of 20 and 70 years, there is a progressive decrease in fat-free mass (mainly muscle) of about 40% and a rise in fat mass. There is a relatively greater decrease in peripheral compared to central fat-free mass. After the age of 70 years, fat-free mass and fat mass decrease in parallel. Fat distribution changes with age such that there is an increase in visceral fat, which is more marked in women than in men. The higher visceral fat is the main determinant of impaired glucose tolerance in the elderly. [6]

Due to the loss of skeletal muscle, the basal metabolic rate declines by 2%-3% per decade after the

age of 20 years, by 4% per decade after the age of 50 years, equating approximately 150 kcal per day, and overall by 30% between the age of 20 and 70 years.[7]

MATERIAL AND METHODS

This was a cross-sectional study evaluated one hundred and thirty-eight elderlies aged ≥ 60 years recruited from 4 nursing homes in West Jakarta. Participants who rejected to participate, mentally ill, and suffer incoherency were excluded from this study.

Data were collected during a face to face interview using a standardized and validated questionnaire. Self-reported respondents in the study involved the completion of all measurements after signing the informed consent form.

Measurements: Body composition and sarcopenia was measured with the bioelectrical impedance. The device measures body mass index (BMI), total body mass, total muscle mass, and percentage of fat mass.[2] In summary, the bioelectrical impedance test allows the normalization of absolute muscle mass (AMM) to height (AMM/height[2]), which is denominated skeletal muscle mass index (SMI). All cardiovascular parameters were analyzed at rest. The procedures for the measurement of blood pressure were adapted from JNC 7.[8]

All subjects underwent a standardized structural clinical evaluation including medical history, physical examination and a comprehensive cognitive assessment along with routine blood tests for measuring lipid profile and blood glucose. Activities of daily living (ADL) and Instrumental Activities of Daily Living (IADL) were assessed using the Barthel index.

Statistical Analysis: Chi-squared test was used according to the analyzed variables. Multinomial logistic regression was created to analyze the association between the independent variables and sarcopenia.

Findings: A total of 138 respondents met the inclusion criteria for the present analyses. Based on the demographic characteristic of respondents, the average age of the elderly was 71.8 ± 7.9 years, mostly were older than 65 (71.7%), majority of the respondent were women (51.4 %), and more than half of the respondent only had formal education <6 years (64.5%). (Table 1)

Table 1: Socio-demographic of respondents (n=138)

Variabel	N	%
Age (71,8 ±7,9)		
≤65 year	39	28.3
>65 year	99	71.7
Gender		
Male	67	48.6
Female	71	51.4
Education Level		
< 6 years	89	64.5
≥ 6 years	49	35.5

Prevalence of mild sarcopenia was 50.7% and severe sarcopenia was 8.0% whereas 41.3% were non-sarcopenia. Based on the health characteristics of respondents, 24.6% were smoking, 54.3% had exercise, and 23.9% were underweight. The most frequent chronic diseases are dyslipidemia (85.6%), followed by hypertension (44.2%), diabetes mellitus (44.1%), and cardiovascular diseases (12.3%). Prevalence of ADL and IADL disability was 50.7% and 33.3% respectively. (Table 2)

Table 2: Characteristic of respondents

Variable	N	%
Sarcopenia (n=138)		
Normal	57	41.3
Moderate Sarcopenia	70	50.7
Severe Sarcopenia	11	8.0
Smoking (n=138)		
Yes	34	24.6
No.	104	75.4
Exercise (n=138)		
Yes	75	54.3
No.	63	45.7
Hypertension (n=138)		
Yes	61	44.2
No.	77	55.8
Dyslipidemia (n=118)		
Yes	101	85.6
No.	17	14.4

Conted…

Cardiovascular disease (n= 138)		
Yes	17	12.3
No.	121	87.7
Diabetes Mellitus (fasting blood sugar) (n= 118)		
≥ 100 mg/dL	52	44.1
<100 mg/dL	66	55.9
Dementia (n=138)		
Yes	119	86.2
No.	19	13.8
Depression (n=138)		
Yes	22	15.9
No.	116	84.1
Activities of Daily Living (ADL) (n=138)		
Disability	70	50.7
Independent	68	49.3
Instrumental Activities of Daily Living (ADL) (n=138)		
Disability	46	33.3
Independent	92	66.7
BMI (weight/height2) (n= 138)		
≥18.5 Kg/m2	105	76.1
<18.5 Kg/m2	33	23.9
Carbohydrate Intake (n= 138)		
Good	75	54.3
Poor	63	45.7

Conted…

Energy Intake (n= 138)		
Good	79	57.2
Poor	59	42.8
Protein Intake (n= 138)		
Good	75	54.3
Poor	63	45.7
Fat Intake (n= 138)		
Good	80	58.0
Poor	58	42.0

After performing Chi Square Test, there was no significant relationship between age, education, smoking, exercise, hypertension, dyslipidemia, cardiovascular disease, dementia, depression, IADL, and BMI ($p > 0.05$).

In comparison with non-sarcopenia respondents, mostly sarcopenia respondents were female (p = 0.012), suffered diabetes mellitus (p = 0.024), and had ADL disability (p = 0.000). Similarly, respondent with less carbohydrate, energy, protein, and fat intake were obtained on respondent with sarcopenia (p = 0.043, p = 0.020, p = 0.003, and p = 0.041). (Table 3)

Table 3: Chi square test for association between sarcopenia and its risk factors

Variable	Sarcopenia			p
	Normal	Moderate Sarcopenia	Severe sarcopenia	
Gender (n= 138)				
Male	27 (47.4 %)	30 (42.9 %)	10 (90.9 %)	0.012
Female	30 (52.6 %)	40 (57.1 %)	1 (9.1 %)	
Age (n= 138)				
≤65 year	12 (21.1 %)	22 (31.4 %)	5 (45.5 %)	0.182
>65 year	45 (78.9 %)	48 (68.6 %)	6 (54.5 %)	
Education Level (n= 138)				
< 6 years	33 (57.9 %)	49 (70.0 %)	7 (63.6 %)	0.365
≥ 6 years	24 (42.1%)	21 (30.0%)	4 (36.4 %)	
Smoking (n= 138)				
Yes	16 (28.1 %)	15 (21.4 %)	3 (27.3 %)	0.673
No	41 (71.9 %)	55 (78.6 %)	8 (72.7 %)	
Exercise (n= 138)				
Yes	33 (57.9 %)	38 (54.3 %)	4 (36.4 %)	0.423
No	24 (42.1 %)	32 (45.7 %)	7 (63.6 %)	

Conted…

Hypertension (n= 138)				
Yes	25 (43.9 %)	30 (42.9 %)	6 (54.5 %)	0.767
No	32 (56.1 %)	40 (57.1 %)	5 (45.5 %)	
Dyslipidemia (n= 118)				
Yes	44 (88.0 %)	49 (86.0 %)	8 (72.7 %)	0.424
No.	6 (12.0 %)	8 (14.0 %)	3 (27.3 %)	
Cardiovascular disease (n= 138)				
Yes	5 (8,8%)	11 (15.7 %)	1 (9.1 %)	0.468
No.	52 (91.2 %)	59 (84.3 %)	10 (90.9 %)	
Diabetes Mellitus (n= 118)				
≥ 100 mg/dL	15 (30.0 %)	30 (52.6 %)	7 (63.6 %)	0.024
<100 mg/dL	35 (70.0 %)	27 (47.4 %)	4 (36.4 %)	
Dementia (n= 138)				
Yes	46 (80.7 %)	64 (91.4 %)	9 (81.8 %)	0.198
No	11 (19.3 %)	6 (8.6 %)	2 (18.2 %)	
Depression (n= 138)				
Yes	6 (10.5 %)	15 (21.4 %)	1 (9.1 %)	0.201
No	51 (89.5 %)	55 (78.6 %)	10 (90.9 %)	
ADL Disability (n= 138)				
Disability	17 (29.8 %)	46 (65.7 %)	7 (63.6 %)	0.000
Independent	40 (70.2 %)	24 (34.3 %)	4 (36.4 %)	
IADL Disability (n= 138)				
Disability	43 (75.4 %)	42 (60.0 %)	7 (63.6 %)	0.181
Independent	14 (24.6%)	28 (40.0 %)	4 (36.4 %)	
BMI (weight/height^2) (n= 138)				
$\geq$18.5 Kg/m^2	45 (78.9 %)	53 (75.7 %)	7 (63.6 %)	0.549
<18.5 Kg/m^2	12 (21.1 %)	17 (24.3 %)	4 (36.4 %)	
Carbohydrate Intake (n= 138)				
Good	48 (84.2 %)	22 (31.4 %)	5 (45.5 %)	0.043
Poor	9 (15.8 %)	48 (68.6 %)	6 (54.5 %)	
Energy Intake (n= 138)				
Good	47 (82.5 %)	27 (38.6 %)	5 (45.5 %)	0.020
Poor	10 (17.5 %)	43 (61.4 %)	6 (54.5 %)	
Protein Intake (n= 138)				
Good	41 (71.9 %)	29 (41.4 %)	5 (45.5 %)	0.003
Poor	16 (28.1 %)	41 (58.6 %)	6 (54.5 %)	
Fat Intake (n= 138)				
Good	43 (75.4 %)	32 (45.7 %)	5 (45.5 %)	0.041
Poor	14 (24.6 %)	38 (54.3 %)	6 (54.5 %)	

By multinomial logistic regression analyses, after adjusted for socio-demographic, there was no significant relationship between age, education, smoking, exercise, hypertension, dyslipidemia, cardiovascular disease, dementia, depression, IADL disability, BMI, protein intake, and fat intake ($p > 0.05$).

We found that gender, diabetes mellitus, ADL disability, carbohydrate, and energy intake had a significant relationship with sarcopenia ($p < 0.05$). (Table 4)

Table 4: Multinomial analysis for association between sarcopenia with related risk factor

Variable	Sig	UNADJUSTED	ADJUSTED*
Gender (n= 138)			
Non-Sarcopenia		1	
Mild Sarcopenia	0.016	13.33 (1.61-109.91)	13.73 (1.63-115.22)*
Severe Sarcopenia	0.026	11.11 (1.33-92.60)	12.81 (1.50-109.33)*
Diabetes Mellietus (FBS) (n= 118)			
Non-Sarcopenia		1	
Mild Sarcopenia	0.505	1.57 (0.41-5.97)	1.55 (0.40-5.91)
Severe Sarcopenia	0.044	4.08 (1.03-16.05)	4.10 (1.04-16.14)*
ADL Disability (n= 138)			
Non-Sarcopenia		1	
Mild Sarcopenia	0.893	0.91 (0.24-3.43)	0.90 (0.23-3.39)
Severe Sarcopenia	0.040	4.11 (1.06-15.93)	4.18 (1.07-16.26)*
Carbohydrate Intake (n= 138)			
Non-Sarcopenia		1	
Mild Sarcopenia	0.364	1.81 (0.50-6.60)	1.82 (0.50-6.62)
Severe Sarcopenia	0.035	4.44 (1.11-17.73)	4.43 (1.11-17.71)*
Energy Intake (n= 138)			
Non-Sarcopenia		1	
Mild Sarcopenia	0.665	1.32 (0.36-4.77)	1.36 (0.37-4.92)
Severe Sarcopenia	0.050	3.91 (1.03-15.39)	3.87 (1.01-15.28)*

* Adjusted with socio-demographic factors ($p < 0.05$)

DISCUSSION

The majority of the subjects in this study came from women and educational level less than six years. Prevalence of sarcopenia in our study was 58.7% (sarcopenia class I / mild, 50.7% and sarcopenia class II / severe, 8.0%), whereas 41.3% were non-sarcopenia. Bahat G, et al (2010), found the prevalence of sarcopenia was 85.4% in a nursing home in Turkey and it was very high among male.[9] Whereas, the prevalence of sarcopenia among nursing home older residents in Cairo was 17.7%; 22.2% in elderly men and 14.4% in elderly women.[10]

Mild sarcopenia was found 57,1% in women, and 90.9% severe sarcopenia in man. Our study found that gender had significant relationship with sarcopenia. Women more likely to be mild sarcopenia 13.3 times than non-sarcopenia and man more likely to be severe sarcopenia 11.11 times than non-sarcopenia.

By multinomial logistic regression analyses, diabetes mellitus also demonstrated higher risk of sarcopenia. Subjects who had diabetes mellitus more likely to be severe sarcopenia 4.08 times than non-sarcopenia. According to Korean Sarcopenic Obesity study, in subjects older than 60 years, the prevalence of sarcopenia was greater in both men and women with diabetes than in non-diabetic counterparts. Defects in insulin signaling can lead to reduced muscle synthesis that might be involved in sarcopenia.[11]

ADL disability, low carbohydrate intake and low energy intake can increase the risk of sarcopenia. In our finding, subjects who had ADL disability more likely to be severe sarcopenia 4.11 times than non-sarcopenia. Low physical activity at work and activity daily living have been identified as risk factors for sarcopenia.[12] The study among nursing home older residents in Cairo detected significant associations between sarcopenia and age, physical activity as well as between sarcopenia and BMI ($p< 0.05$).[13] However, a decrease in skeletal muscle mass is a universal consequence of aging with a broad array of functional and metabolic consequences. Skeletal muscle is the major consumer of energy and contributor to basal metabolic rate (BMR) in the body, and loss of muscle is the primary cause of age-associated reduced BMR and decreased energy needs. [14] Sarcopenia appears to be an age-related phenomenon, exacerbated, by a sedentary lifestyle, nutritional factors, and chronic disease, which cause increased risk of musculoskeletal injuries and other morbidities, leading to frailty and loss of independence.[14]

We also found that subjects who had low carbohydrate intake more likely to be severe sarcopenia 4.44 times than non-sarcopenia and subjects who had low energy intake more likely to be severe sarcopenia 3.91 times than non-sarcopenia. Sarcopenia is a multifactorial disorder, Hashemi et al, 2015 found that western diet that loaded with carbohydrate surprisingly not associated with sarcopenia.[15] The lack of association could be because the presence of others food such as soy products and tea. Chaput et al. (2007) found that there are relationship between energy intake and total protein intake with sarcopenia. They found that energy intake ($P<0.05$) and total protein intake ($P<0.01$) were significantly higher in the non-sarcopenic group than in the sarcopenic group.[16] Possible causal factors include age-related changes in the secretion of malnutrition and decline in dietary intake, changes in physical activity and a sedentary lifestyle, and decreases in muscle innervation. Malnutrition is highly prevalent in the frailest groups, especially in low-income people. Beyond low income, socioeconomic factors such as loneliness and low education may affect food availability and, subsequently, nutritional status.[17] Therefore, less of adequate nutritional intake activates the immune system and increases synthesis of inflammatory cytokines amplifying the chronic catabolic conditions so that reducing muscle mass and, consequently, lower body function.[17]

CONCLUSION

Sarcopenia is highly prevalent among elderly living in urban nursing homes, 58.7% and 8 % who were categorized as having severe sarcopenia. Sarcopenia, especially severe sarcopenia influenced by multiple risk factors such as gender, diabetes mellitus, ADL disability and malnutrition, mainly for carbohydrate intake, and energy intake.

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Aerobic Fitness at Young Age on Immediate and Long Term Cardiovascular Disease Risk Factors: Evidence From Cardia Study and Its Implications in Indian Context

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ABSTRACT

Objective: To summarize the data presented in CARDIA study that examined the association between aerobic fitness (AF) and CVD risk factors; to describe the effect of AF in young age on advancing age; to report the implications of these results to Indian context.

Methods: PubMed search engine was used and search term "CARDIA study" [title/abstract] used in advanced search on April 2017. 8 articles from 481 titles were selected for review.

Results: Baseline data showed that high AF was superior to low AF in terms of CVD risk factors. High baseline AF lowers the incidence of hypertension, diabetes and mortality. AF decreased over the timeline with high fitness group lost the maximum. Rate of decline was equal in both males and females; both high and low risk group.

Conclusion: Observational cohort based on AF, interventional cohort to improve AF should be started in Indian population to confirm CARDIA findings.

Keywords: *Cardiorespiratory fitness (CRF); Aerobic endurance; Cohort; Adults; Review*

INTRODUCTION

Fitness is considered to be important marker of health in both young and old age. Numerous studies have explained the correlation of cardiorespiratory or aerobic fitness on mortality and morbidity as the cardiovascular diseases (CVD) accounts for large proportion of morbidity of the population[1].

Started in 1985-86, CARDIA study is one of the oldest and longest longitudinal cohort study that focused on aerobic fitness at young age (i.e) 18-30 years on CVD risk factors, diseases, mortality. This cohort has now crossed more than 30 years and has the publications of 25 years old data[2-9]. It also reports the longitudinal changes in aerobic fitness on CVD and its risk factors. The findings of this cohort has thrown the light on already known fact that aerobic fitness is beneficial effect in preventing chronic diseases. This cohort has answered many important questions like Baseline fitness at young age or improving fitness across young to middle age: which one is the best? Does aerobic fitness is independently prevent/associated with CVD risk factors or not? Etc. So it is the high time to translate that what has CARDIA study taught through its findings to the developing countries like India?

Thus, the Objective of this short review was to summarize the data presented in CARDIA study that examined the association between aerobic fitness and BMI, waist circumference (obesity), blood glucose (diabetes), blood pressure (hypertension) in young adults; and to describe the effect of aerobic fitness in young age on advancing age. Finally to report the implications of these results to Indian context (i.e) start a cohort that should focus on fitness and CVD risk factors.

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METHODOLOGY

We searched PUBMED in April 2017 using following terms in advanced search option. The term used was "CARDIA study" [title/abstract] which yielded 481 titles. We screened the titles and selected 11 potential articles for this review. We could not get full-text of 2 articles even after an attempt to contact the corresponding author and one article was dealing aerobic fitness on lipid parameters resulting 8 articles that were used in this review.

CARDIA study, started in 1985-86, used modified Balke protocol- a progressive maximal exercise protocol- to assess aerobic fitness. Fitness was measured in either stages- total 9- or in minutes and seconds- maximum of 18 minutes. Over the 30 years, CVD risk factors were measured at baseline, 2, 5, 7, 10, 15, 20 and 25 years after that (7 follow-ups- total 8 readings) whereas aerobic fitness was measured at baseline, 7 and 20 years after that (2 follow-ups- total 3 readings). All the papers used in this review were based on these data.

RESULTS

Baseline data showed that compared to low fitness (<20%) group, high fitness (>60%) group had lower waist circumference (mean 68.8 cm vs 85.6 cm for women; 78.9 vs 88.8 for men), BMI (21.8 Kg.m^{-2} vs 30.6 Kg.m^{-2}; 23.2 vs 27.4), SBP (104.7 mmHg vs 109.7 mmHg; 113.9 vs 117.2), DBP (66.0 mmHg vs 68.6 mmHg; 70.0 vs 72.2), glucose (80 mg/dL vs 82.4 mg/dL; 83.6 vs 85.2) among 2458 women and 2029 men respectively [2]. Higher fitness group also had lower prevalence of hypertension (0.9% vs 3.5% for women; 1.7% vs 6.1% for men), diabetes (0.1% vs 1.1%; 0.4% vs 1.1%), abdominal obesity (0.6% vs 38.2%; 0.2% vs 14.6%), metabolic syndrome (0% vs 5.7%; 0.3% vs 8.1%) than low fitness group in both women and men[2].

Low aerobic fitness at young adult (18-30 years) is associated with development of hypertension (HR 2.17; 95% CI 1.69-2.78 in low vs high fitness), diabetes (HR 1.75; 1.01-3.04), hypercholesterolemia (HR 1.02; 0.76-1.36), metabolic syndrome (HR 1.87; 1.42-2.48) at 15 years later[2]. Incidence of diabetes was 11.5-12.0% after 25 years[3-5]. After 25 years follow-up, people with diabetes/pre-diabetes had higher treadmill duration at baseline, 7 and 20 year follow-ups than people without diabetes[3, 4]. Every 2.7 minutes (SD) reduction in treadmill time at baseline is associated with significant raise in incidence of diabetes at 20 years later (HR for black men 1.80, black women 2.03, white women 3.15 and white men 3.36)[6]. Similarly every SD (3.0 minutes) raise at baseline reduced the diabetes (OR 0.71; 95% CI 0.60-0.85) at 25 years later[3] and every SD (2.9 minutes) raise at baseline, reduced the incidence of hypertension at 20 years later (HR 0.52; 95% CI 0.48-0.57)[7]. They also reported that improving fitness by one category at baseline would prevent hypertension incidence by 28%, 37%, 21% and 46% for black women, white women, black men and white men respectively[7]. Every minute raise in baseline treadmill time reduced by 15% for mortality (HR 0.85; 95% CI 0.80-0.91 and 12% reduction in CVD events (HR 0.88; 0.81-0.96) at 25 years later[8].

Over 7 years aerobic fitness was reduced to 7.6% ±21% in women and 9.2% ±16% in men (overall median reduction -1.0 minute; interquartile range -2.03; 0.08 minutes)[6, 8] with persons with diabetes and pre-diabetes had larger reduction[4]. Treadmill time reduced to 27.5% ±19.9% in women and 27.3% ±17.5% in men at 20 years follow-up[6] with people with diabetes/pre-diabetes had larger reduction[4]. 308 out of 2472 (12.5%) participants increased at least 1 minute treadmill time at 7 year follow-up and have significant reduction in all-cause mortality, CVD events at 25 years later[8]. 20.6% of participants (increased to ≤20% decline of treadmill time from baseline) maintained the fitness after 20 years with normal BMI participants had highest percentage of maintained fitness[5]. Maintained fitness was less common in high baseline fitness (7-17%) group than low baseline fitness group (25-41%)[5]. Maintained fitness group at 20 years gained less weight and waist circumference, higher HDL, lower LDL and triglycerides, less raise in blood pressure after 25 years than decreased fitness group[5].

7 years improvement of aerobic fitness is reducing diabetes and metabolic syndrome incidence rate. They reported that each 1 minute increment in treadmill test at 7 years reduce the hypertension (HR 0.99; 95% CI 0.93-1.04), diabetes (HR 0.89; 95% CI 0.80-1.00), hypercholesterolemia (HR 0.99; 95% CI 0.93-1.05) and metabolic syndrome (HR 0.88; 95% CI 0.83-0.93) incidence[2]. Each minute reduction of treadmill time after 7 years had increased the death as well as CVD events by 21% and 20% respectively (HR 1.21; 95% CI 1.7-1.37 and HR 1.20; 1.06-1.37 respectively)[8]. After 7 years, every 19% decline from baseline leads to

51% raise in diabetes incidence in men (HR 1.51; 95% CI 1.19-1.92) and more than 100% raise in diabetes incidence in women (HR 2.02; 1.46-2.79) at 20 years later[6].

Result showed that baseline weight, weight change (mean: 7 Kg increase in 7 years and 12.7 Kg increase in 15 years) and BMI act as modifier for fitness as it has inverse relationship with weight, weight change and BMI. Increasing treadmill time over the visits lowers the risk of diabetes and metabolic syndrome development[2].

Compared to rest, persons with elevated metabolic risk (upper 10% for race and sex) had a lower physical activity, fitness at baseline (treadmill time ~10 minutes vs 12 minutes for men with risk vs rest; ~6.5 vs 8.5 for women) and rate of decline (treadmill time ~2 minutes reduction at 20 years) was maintained up to 20 years with maximum rate of decline at first half (i.e) 10 years. Hence they recommended that interventions to promote fitness should start at early adulthood[9]. Impact of fitness maintenance on diabetes incidence is moderated by insulin resistance at young adults, Chow et al.[5] advocated that fitness interventions should focus on muscle-insulin sensitivity by incorporating life-style interventions at adolescent age.

The limitation as well as strength of this review is that all the evidences are from one cohort from US which primary focus was to observe racial and sex difference in the development of chronic diseases. There is no such cohort available from India which has diverse sociocultural difference. Another potential limitation is that being known that aerobic fitness at young age prevents future development of CVD risk, there should be interventional cohort that aims to improve the aerobic fitness at young age on future development of CVD risk.

The result of this review suggests that higher fitness levels at young adult age would reduce the incidence of CVD risk factors in later age that maintained up to middle age. This effect is superior to that of improving fitness from young adult through middle age. Hence future research should focus on fitness improvement at 25 years or younger. As the current Indian prevalence of physical inactivity, hypertension, diabetes and obesity is comparable to that of western counterparts, future Indian research should focus on improvement of aerobic fitness at younger age to counter them.

CONCLUSION

Observational cohort similar to CARDIA study should be started in India as it has diverse sociocultural differences and differs from developed western world. Interventional cohort that improves aerobic fitness at college days should be started in India as, superior aerobic fitness at young age was clearly shown to be advantageous.

Ethical Clearance: Since it is a review article (no humen/animals directly involved), there is no need of ethical clearance.

Source of Support: Nil

Conflict of Interest: Nil

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A Cross Sectional Study of Factors Influencing Childhood Immunization in a Tertiary Care Institution of Amritsar– A Hospital Based Study

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ABSTRACT

Background: Vaccination is a proven tool in preventing and eradication of communicable diseases. Due to various reasons children fail to complete the full course of immunization. Factors influencing the low vaccination coverage have been poorly understood at the national and regional levels thus for this a study has been designed.

Aim and Objectives: To identify the factors associated with incomplete vaccination/un-vaccination in children less than five years of age.

Material and Method: This was a cross sectional study carried from November 2016 to January 2017 in immunization clinic of Urban Health Training Center, Department of Community Medicine, Sri Guru Ram Das Institute of Medical Sciences & Research, Amritsar. In this study, 994 children aged 0-5 years were listed. The study   involved interviewing the mothers/caregivers having children in the age group of 0-5 years. , Statistical analysis was done and valid conclusions were drawn.

Results: Three main factors influencing the vaccination of children were: Lack of information (71.66%) and motivation (10%) of the mothers; and side effects of vaccination (fever, pain etc.) in children. 95.77% mothers were literate and 86.32% had received Antenatal/Postnatal care. Sex of children was not a significant factor influencing immunization.

Discussion: Present study showed that most of the children (93.96%) were completely Immunized. The study showed a direct positive correlation of the higher socio-economic, literacy status of mothers/caregivers, and place of delivery with immunization coverage of the children. Immunization coverage was higher in children of mothers delivered in Health institutions and who had antenatal/post-natal checkups than in children of mothers delivered in homes; and without ANC/PNC check-ups.

Keywords: *childhood immunization, prevalence, Chi square, antenatal, post-natal care, socio-demographic factors.*

INTRODUCTION

In developing countries like India where the prevalence of vaccine preventable diseases among infants, children and women of child bearing age is common due to poor nutritional and environmental sanitation, immunization is an important means of protecting these individuals against the vaccine preventable diseases. Immunization is one of the most important Public Health Interventions and cost effective strategy to reduce both the morbidity and mortality associated with these vaccine preventable diseases. Indeed, Immunization   forms the major focus of child survival programmes throughout the world.[1] Two million to three million deaths have been averted through immunization and approximately three million children die each year worldwide due to the vaccine preventable diseases[2.] Recent estimates suggest that approximately 34 million children are not completely immunized, with almost 98% of them residing in the developing

countries.[3] Though there is increased accessibility of health care services in both urban and rural areas in India, still the utilization of health care services is low in the different segments of the society. Despite the awareness, immunization coverage of children is still lagging behind the goal of universal immunization programme (UIP) especially in this part of the country which is much less than the desired goal of achieving 85 per cent coverage[4] Even though the immunization services in India are being offered free of cost in public health facilities, about 45% of Indian children are deprived of the recommended vaccinations[5].

Hence the present study was undertaken with the aim to identify the factors associated with incomplete vaccination/un-vaccination of children below five years of age.

MATERIAL AND METHOD

The study was a cross sectional study that involved interviewing the mothers/primary caregivers having children below five years of age to note their maternal characteristics and immunization history. It was carried out from November 2016 to January 2017 in the Urban Health Training Centre of Sri Guru Ram Das Institute of Medical Sciences and Research, Amritsar using a pre-designed and pre-tested questionnaire. After taking permission from college ethics committee, all the children in the age group of 0-5 years attending the UHTC for vaccination during the period of study were included and the required information was collected on the performa. The information provided by the mother/caregiver was verified from the immunization card of the child and if the card was not available, validation of immunization history was done by seeking information about the time and source of immunization and inspecting the BCG scar on the left upper arm (usual site).Educational status of mother was noted. Children were classified as fully immunized who had received all vaccines including BCG,(Pentavalent vaccine,IPV,Measles vaccine) in proper doses and at proper time, Partially immunized: Child who had not been completely immunized but received only one or two doses of vaccine for his/her age as per National Immunization schedule and unimmunized children who had not received any vaccine till the date of study though they may have received polio

drops in the pulse polio drive). Those children who were unvaccinated or partially vaccinated, were asked to tell a single most common reason for this.

Statistical analysis: The data was summarized and the frequencies and percentages of the socio-demographic characteristics; fully vaccinated, partially vaccinated and un-vaccinated children were calculated. Chi-square test was applied to find out the significance of the difference in the vaccination status of the categories mentioned.

Inclusion criteria: Children under five years of age attending the immunization clinic of SGRDIMSAR.

Exclusion criteria children, who were seriously ill, too agitated & unwilling for immunization.

Tools: Structured questionnaire and Immunization cards.

OBSERVATIONS

Table 1: Distribution of children according to their number & sex (n = 994)

Male	573	57.65
Female	42	42.35
Total	994	100. 00

Table no 1. A total of 994 children under five year of age were listed. Out of these, 573 (57.65%) were male and 421 (42.35 %) were female children.

Table 2: Socio-demographic characteristics of the study population (n=994)

Variable		Number	(% age)
Religion	Hindu	380	38.23
	Sikh	544	54.73
	Muslims	28	2.82
	Christians	22	2.21
	Others	20	2.01
Resident status	Resident	795	79.98
	Migrant	199	20.0
Literacy status of Mother	Illiterate	42	4.23%
	Primary	58	5.83
	Secondary	368	37.02
	above Secondary	526	52.90

Conted…

Occupation of the mother/ father	Skilled	394	39.64
	Unskilled	248	24.95
	Professional	48	4.83
	Labour/ Daily Wages	106	10.70
	Private/ Govt job	198	19.91
Type of the family	Nuclear Family	132	13.28%
	Joint Family	862	86.72%
S-E status of the Family *On the basis Of Modified B.G Prasad Classification July 2014.	*Class-I	328	33%
	Class-II	373	37.52%
	Class-III	158	15.90%
	Class-IV	79	07.95%
	Class-V	56	05.63%
Immunization card	Present	880 (88.53%)	
	Not present	114 (11.47%)	

Out of the total 994 study subjects 380(38.23%) were Hindus, 544 (54.73%) were Sikhs,28 (2.82%) were Muslims, 22 (2.21%) were Christians and Others were 20 (2.01%). Out of 994 study subjects 795 (79.98%) were resident and 199 (20.02%) children were belonging to migratory families. As far as literacy status of the study population (mothers) was concerned, maximum number 952 (95.77%) of mothers were literate.[526 (52.92%) had educated above the secondary level of education, followed by 368 (37.02%) were educated up to secondary level,40 were educated up to middle level,18 were had received up to primary level education] and 42 (4.23%) were illiterate. Out Of total 994 study subjects, 394 (39.64%) were skilled workers,248 (24.95)

were unskilled/semiskilled workers, 48 (4.83%) were professionals,106 (10.70) subjects were Laborers /and daily wagers, followed by 198 (19.91%) were in Private/ Govt. Jobs. 862(86.72%) children were belonging to joint , and rest 132(13.28%) belonged to nuclear families. As far as Socio-economic status of the study population was concerned, out of the 994 subjects, 328 (33%) belonged to socio-economic status class-I, followed by 373 (37.52%) to class-ii,158 (15.90) to class-iii, 79 (07.95 %) to class-iv, and rest 56 (05.63%) were belonging to class –V.Majority of mothers had immunization cards of the child with them(88.53%).

Table 3: Sex wise vaccination status among study subjects (n=994)

Variable	Male (573)	Female (421)	Total (994)
Fully vaccinated	535 (93.36%)	399 (96%)	934 (93.96%)
Partially vaccinated	26 (59.1%)	18 (40.9%)	44 (4.43%)
Un-vaccinated	5 (31.25%)	11 (68.75%)	16 (1.61%)

$X^2 = 0.796$, df = 2, p = 0.939 (insignificant)

The above table reveals that 934 (93.96%) infants were completely immunized as per their age. Immunization coverage was found more among the females (96 %) as compared to males (93.36%) though the difference was found to be statistically insignificant (chi=0.796, p>0.05).44 (4.43 %) children were partially immunized and16 (1.61 %) were unimmunized . Out of 16 unimmunized, 5 (31.25%) and 11 (68.75 %) were male and female children respectively had not received any vaccination. Though the percentage of the partially vaccinated and unimmunized children was more among the females.

Table 4: Vaccination status of children in relation to age (n = 994)

Age in months	Fully vaccinated children N=934 (93.96%)	%age	Partially vaccinated children N=44 (4.43%))	%age	Unvaccinated children N=16 (1.60%)	%age
0 – 12	159	94.08	8	4.73	2	1.18
13- 24	167	93.8	7	3.94	4	2.25
25- 60	668	93.97	29	4.49	10	1.55

$X^2 = 0.796$, df = 4, p = 0.939

This table shows that the maximum percentage (94.08%) of fully immunized children were in the age group of 0-12 months followed by the rest (93.8%,& 93.97%) in the age groups of 13-24 months and 25-60 months respectively of the children. The difference was statistically insignificant.

Table 5: Distribution of children according to their socio-economic factors

Socio-economic status	Fully vaccinated (n=934)	% age	Partially vaccinated (n=44)	% age	Unvaccinated children (n=16)	% age
Class I (328)	319	97.26	4	1.22	0	-
Class II (373)	366	98.12	6	1.61	0	-
Class III (158)	138	87.34	8	5.06	1	-0.63
Class IV (79)	68	86	14	17.72	7	8.86
Class V (56)	43	76.78	12	21.49	3	5.36
X^2 = 134.299, df = 8, p = 0.000						
Literacy status	Fully vaccinated (n=934)	% age	Partially vaccinated (n=10)	% age	Unvaccinated N(=16)	%age
Literate 952 (95.77%)	890	93.49	4	0.42	5	0.52
Illiterate 42 (4.23%)	31	73.80	6	14.29	1	2.38
X^2 = 84.014; df = 2; p=0.000						
Family Type Joint	862	86.72	6	0.7	2	0.23
Nuclear	132	13.28	7	5.30	5	3.37
X2 = 36.28; df = 2; p = 0.000						
Immunization cards (n = 994)	Fully vaccinated	% age	Partially vaccinated	% age	Un-vaccinated	
Present 816	809	99.14	05	0.61	02	
Absent 178	163	91.57	12	6.74	03	
Total 994	972		17		5	
X^2 = 38.96; df = 2; p = 0.000						

This table shows that higher socio-economic class-I &ll (97.26% & 98.12%) status and literacy subjects(93.49%) were more likely to be fully immunized as compared to those with low socio-economic status class and literacy. (P=000 highly significant). Children of mothers/caregivers belonging to joint families were more likely to be fully immunized (86.72%) This finding was statistically highly significant as compared to nuclear families which might have provided support to the family.

Children of the mothers who had an immunization card had higher (99.14%) immunization coverage as compared to those who did not have the immunization cards. Which was a significant finding (p=0.000)

Table 6: Distribution of newborns according to their place of birth and at birth vaccination

Place of delivery	Number	At Birth Vaccination BCG/OPV/Hepatitis-B given	At Birth vaccination not BCG/OPV/ Hepatitis- B not not given
Institutional	428 (43.06%)	417 (97.42%)	11 (2.58%)
Domiciliary	566 (56.94%)	21(03.71%)	545 (96.29%)
Total	994	438 (44.1)	556 (55.93%)
X^2 = 868.479; df = 1, p = 0.000			

This table shows that most of the deliveries (56.94 %) took place in the homes as compared to institutional (43.06%) deliveries. Out of the 428 institutional newborns 417 (97.43%) were given at Birth,BCG , zero dose of OPV and Hepatitis B vaccines before they were discharged from the hospital as compared to domiciliary deliveries. (03.71%).This observation was statistically highly significant

This table depicts three basic factors, lack of motivation and information 49 (81.66%), and side-effects11 (18.3%) of the vaccines were the factors for non-compliance of vaccination.

Table 7: Reasons for partial vaccination/un-vaccination of children

Reasons	Number of Children (%)
Lack of Motivation	6 (10)
Lack of Information	43 (71.66)
Due to side effects (fever, pain)	11 (18.34)

Table 8: Relationship between place of delivery, ANC/NC and vaccination

Place of Delivery	No. of Deliveries (n=994)	Whether informed regarding vaccination yes	Percentage (%)
Domiciliary Delivery	566	29	5.12
Institutionalized Delivery	428	407	95.1

Relationship between ANC/NC and vaccination

	No & percentage	Vaccination completed	Partial vaccinated/un-vaccinated
A NC/PNC Received	858 (86.32%)	842(84.70%)	16 (1.86%)
ANC/PNC not received	136 (13.68%)	92 (67.65%)	44 (32.35%)
X^2 = 192.387; df = 1; p-value = 0.000 (Highly significant)			

This table shows that out of out of 994 deliveries, 428 deliveries took place in the health institution, While 566 mothers delivered at homes by the Dai's.out of 566 home deliveries, 29 (5.12%) mothers were informed about vaccination as compared to 407(95.1%) mothers who delivered in institution. 858 (86.32%) out of 994 mothers had received antenatal care during pregnancy and 842(84.70%)mothers got their new-born completely vaccinated.136 (13.68%) mothers had not received ANC/PNC and only 92 (67.65%) of their children were fully vaccinated. This finding was statistically highly significant (p0.000).

DISCUSSION

The current study showed that majority of the children were completely immunized (93.96%).This finding was similar to the study conducted by Padda P et al[5], in Amritsar but in contrast to the study conducted by Saxsena P et al[6] who found that only 30% of the children were completely immunized. This might be due to better knowledge,socio-economic status, literacy rate and area of the study population. The impact of various socio-demographic factors on age appropriate vaccination was studied (Table 2).It was observed that percentage of infants fully immunized as per their age was marginally higher among children of 0-12 months of age in comparison to other age groups. The difference was statistically insignificant. Contrary to the general perception, percentage of the female children was better (96%) than males (93.36%). Similar findings were observed by Malkar et al in Maharastra.[7] Higher socio-economic status and literacy subjects were more likely to be fully immunized as compared to those with low socio-economic status class and literacy. Similar finding showing a positive correlation between maternal education status and complete immunization status of children was reported by Mathwes in a review study[8]. Children born in the joint families were more likely to be vaccinated as compared to nuclear families, which might provide support to the family. Children of mothers who had an immunization card had higher (99.14%) immunization coverage for routine vaccines as compared to those who did not . These findings are in tune with the findings of another study conducted by Gill KP, Devgun P. in Amritsar[9]. Other factors that were associated with vaccination status were the place of birth, antenatal care/ post natal Care. Children born at home were less likely

to receive BCG and zero dose of OPV and Hepatitis B (03.71%) as compared to those born in hospital (97.42%). These findings were in consistent with the studies of Coetzee N et al, Berry DJ, Jacobs ME in Mozambique and South Africa[10]. Mothers who deliver at home may be non-users of the health services in general and have to be targeted for utilization of health services. Mothers who had received Antenatal/postnatal checkups during their pregnancy were more likely to have their children fully vaccinated (84.70%) as compared to those mothers who had not received antenatal/postnatal checkups (67.65%) .44 (32.35 %) of their children were either partially vaccinated or never vaccinated. Similar findings were observed by Indian Society of Health Administrations[3].

CONCLUSION

Institutional delivery was highly significant factor influencing the immunization coverage among under-five children.

RECOMMENDATIONS

Institutional deliveries should be promoted so that every child should be vaccinated at birth place before they are discharged. Efforts should be made to increase IEC activities by the health-workers in order to increase awareness among mothers/caregivers.

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Understanding Pre-diabetic Life Style as a Determinant Factor of Type-2 Diabetes Mellitus in South Sulawesi Province, Indonesia

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ABSTRACT

Background: Diabetes mellitus (DM) was health problem globally. This research aims to know the influence of prediabetic life style to be type2 DM.

Method: This was hystorical cohort study located in South Sulawesi Province, Indonesia in 2016. The exposure was life style while outcome was incidence of type-2 DM. Source of life style data was using the Indonesian Basic Health Research 2013, while DM was conducted by glucose test. Samples were as many as 192 respondent, divide into two group expose and un-exposed. The data was analyzed by Cox Regression using SPSS.

Results: The incidence of type-2 DM in non-exposed group was 32.7%, while in exposed group was 41.3%. The high risk of life style group were more likely to be type-2 DM than the low risk one (RR 1.9, CI95% 1.11-3.32). Factors affected type-2 DM were found including smoking habit (former smokers: RR 2.9, 95%CI 1.57-5.23, while smoker RR 2.2, CI95% 1.06-4.38); physical activity (moderate activity: RR2.4, CI95% 1.27-4.56, light activity RR 3.4, CI95% 1,79-6,78 than heavy group).

Conclusions: Less activity and smoked people were more likely to be suffer from type-2 DM, while eating habit have no significant effect on Type 2 DM incidence.

Keywords: lifestyle, smoking, eating, activity, DM.

INTRODUCTION

Type-2 diabetes mellitus is a long term metabolic disorder, characterized by high blood sugar, insulin resistance, and lack of insulin. Common symptoms include increased thirst, frequent urination, unexplained weight loss and fat tissue[1], coma and ends with death.

WHO reports that 30 million people are suffering from DM in 1985, an increase of 170 million (2.8%) in 2000. It is predicted that 360 million (4.4%) are DM in 2030[2]. Statistic show that the largest country of DM population is India (79.4 million), China (42.3 million), USA (30.3 million) and Indonesia (21.3million [3-5]. In Indonesia 2010, the number of DM population is over than 7 million (3%), an increase of approximately 14.82 million people in 2013 (6.9%)[6-7.]

According to the Expert Committee of Diagnosis and Classification type-2 DM 2003, someone will suffer from prediabetic before being type-2 DM[8]. Pre-diabetes is condition of blood glucose levels are higher than normal, but lower than type-2 DM criteria[7,9]. Pre-diabetes are 30% more likely to be type-2 DM in 4-10 years [9-11], but more than 90% of prediabetic patient lack of knowledge about DM [10]

The most effective intervention for prediabetic are improving lifestyle, i.e. combination of diet and exercise, it has cost effectiveness ratio as many as $ 36,00 /DALY (disability adjusted life year), larger (97%) than anti diabetes medicine, (64%)[12].

MATERIALS AND METHOD

Resarch Design: This wa hystorical cohort design conducted on July-December 2016 in Bugis, Makasar and Toraja tribes, South Sulawesi Province, Indonesia.

Population and Samples: The study population was biomedical samples of Basic Health Research 2013 were aged >15 years. Samples were prediabetic, as many as 96 expose and 96 un-exposed group. (Pic. 1)

Variables: The dependent variable was DM. A fasting blood sugar level from capillary >126 mg/dL (> 7.0 mmol/L) or 2 hours post prandial >200 mg/dL (> 11.1 mmol/L) using glucose strips accuchek test was considered DM. The independent variable was lifestyle; consisting of physical activity, eating and smoking habit. The exposured was categorized by median: < median was a low-risk lifestyle (un-exposed) while > median was a high-risk lifestyle (exposed), the physical activities classified into heavy, moderate and light. The eating habits were classified into high risk while sweety, fatty, and high cholesterol, and meat/fish/chickes that procceded by multiproccesed and preservatives. External variables were including age, sex, setting, job and education level.

Instrument: Life style data was collected by individual questioners from Basic Health Research 2013, while the blood sugar level was collected by capillary using performa accu chek.

Data analysis: Bivariate analysis was undertaken by cox regression, while multivariate analysis by cox proportional hazard. The most parsimonius and the best fit model was used at the end of the analysis. The entire analysis was tested using SPSS. This research was approved by Health Research Ethics Committee of Indonesia University No. 103/UN2. F10/PPM.00.02/2006. Respondents stated their agreement by signing, and the researcher ensured all data confidentiality.
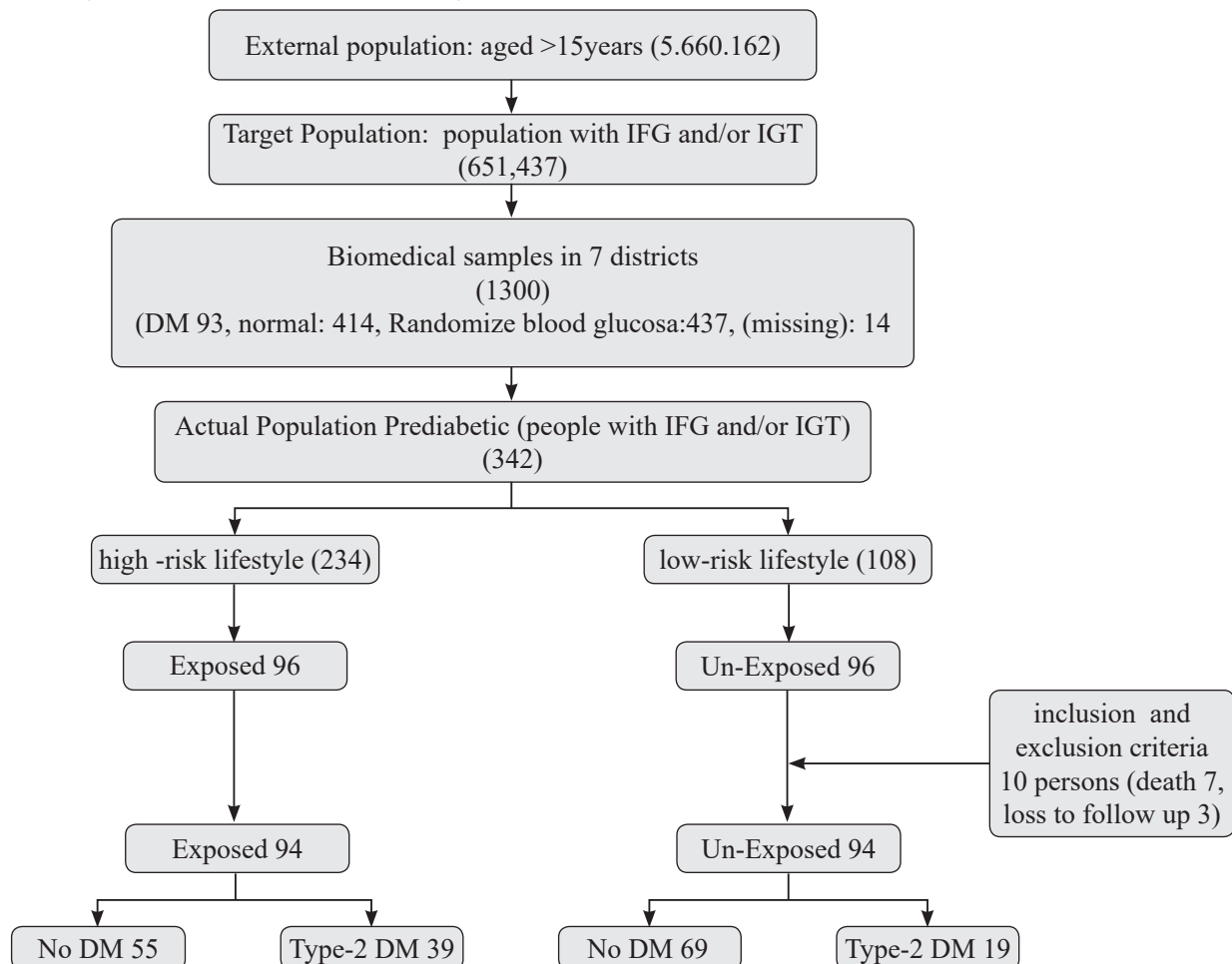
Picture 1: Samples Selection

RESULTS

The Risks Factors of Type 2 DM: This study consist of the 182 respondents, 31.87% of prediabetic became Type 2 DM. Several risk factors were described in Table 1.

Table 1: The Risk Factors of Type 2 DM, South Sulawesi, Indonesia

Variable	Type-2 DM				Total	p	RR	95% CI
	Yes		No					
	n	%	n	%				
Life Style								
Low risk	19	21.6	69	78.4	88		1	
High risk	39	42.5	55	58.5	94	0.02	1.9	1.11-3.32
Smoking Habit								
No smoker	32	23.2	106	78.5	138		1	
Former smoker	10	50.0	10	50	20	0.03	2.2	1.06-4.38
Smoker	16	66.7	8	33.3	24	0.01	2.9	1.57-5.23
Physical Activity								
Heavy	16	17.9	78	82.1	94		1	
Moderate	23	36.4	33	63,6	56	0.007	2.4	1.27-4.56
Light	19	65.6	13	34.4	32	0.000	3.4	1.79-6.78
Dietary Fiber								
Yes	42	32.3	88	67.7	130		1	
No	16	30.8	36	69.2	52	1.00	1.05	0.65-1.69
Food								
No risk	12	28.6	30	71.4	42	0.70	0.87	0.51-1.50
High risk	46	32.9	94	67.1	140			

Significant correlation were found between type-2 DM with life style, eating habit and physical activity. Respondent who have high risk of life style were more likely to be suffer from type2-DM (RR 1.9, CI95% 1.11-3.32); smoker and former smoker were more likely to be type-2 DM then no smoker (RR 2.2 CI95% 1.06-4.38 and 2.9 CI95% 1.57-5.23 respectively), moderate and light activity were more likely to be suffer from type-2 DM than heavy one (RR 2.4 CI95% 1.27-4.56 and 3.4 CI95% 1.79-6.78 respectively) (Table 1).

The association between covariate variables and type-2 DM show that DM was significant correlation with sex (Table 2).

Table 2: Association Between Covariate Variable and Type-2 DM

Variables	Type-2 DM				Total	p	95% CI
	Yes		No				
	N	%	n	%			
Age (year)							
<45	21	31.8	45	68.2	66	0.99	0.58-1.71
>45	37	31.9	79	68.1	116		
Sex							
Male	28	45.2	34	54.8	62	0.02	0.33-9.26
Female	30	25.0	90	75.0	120		

Conted…

Setting							
Urban	38	32.8	78	67.2	116	0.78	0.53-1.59
Rural	20	30.3	46	69.7	66		
Work							
Yes	30	35.7	54	64.3	84	0.39	0.47-1.34
No	28	28.6	70	71.4	98		
Education Level							
Low	34	29.8	80	70.2	118	0.52	0.70-1.99
Middle	24	35.3	44	64.7	68		

Multivariable analysis show that significant correlation was found between type-2 DM with life style (HR 2.5,CI95% 1.04-5.72), while former smoker more likely to be type-2 DM than no smoker, and middle and light activity are more likely to be suffer from type-2 DM than heavy group (2.01 CI95% 1.01-3.99 and 2.35 CI95% 1.09-5.07 respectively) see table 3.

Table 3: Association between Independent Variabel and Type-2 DM after adjusted by Covariat Variables.

Variable	Type-2 DM				HR	95% CI	p-value
	Yes	%	No	%			
Life Style					1.92	1.08-3.55	0,02
Low risk	19	21.9	69	78.1			
High risk	39	43.0	55	57.0			
Smoking habit							
No smoker	32	23.2	106	78.5			
Former smoker	10	50.0	10	50.0	3.3	0.93-10.90	0.06
Smoker	16	66.7	8	33.3	3.3	1.07-10.08	0.03
Physical activity							
Heavy	16	17.9	78	82.1			
Moderate	23	36.4	33	63.6	2.01	1,01-3,99	0.04
Light	19	65.6	13	34.4	2.35	1,09-5,07	0.02
Food							
No risk	12	28.6	30	71.4	0.71	0,32-1,57	0.40
High risk	46	32.9	94	67.1			
Dietary fiber							
Consumption	42	32.3	88	67.7	0.90	0,40-2,02	0.81
No	16	30.8	36	69.2			
Age (year)							
<45	31	32.6	64	67.4	0.95	0,55-1,65	0.88
>45	27	31.0	60	69.0			
Sex					1.25	0,51-3,02	0.61
Female	30	25.0	90	75.0			
Male	28	45.2	34	54.8			
Work							
Yes	30	35.7	54	64.3	1.06	0,54-2,0	0.85
No	28	28.6	70	71.4			
Education level							
Low	34	29.8	80	70.2	1.01	0,51-2,00	0.97
High	24	35.3	44	64.7			
Setting					1.12	0,56-2,27	0.74
Rural	38	32.8	78	67.2			
Urban	20	30.3	40	69.7			

The best fit model indicating that DM have strong association with life style, middle and light activity (p-value 0.039, 0.031 and 0.023.respectively), (Table 4).

Table 4: Best Fit Model Analysis of Risk Factors Associated with Type-2 DM

Variable	B	SE	p-value	Exp (B)	95% CI Exp (B)	
					Lower	Upper
Life style	0.895	0.434	0.02	1.92	1.11	3.32
No smoker						
Former smoker	0.478	0.512	0.08	1.8	0.91	3.81
Smoker	0.073	0.379	0.01	2.1	1.16	4.12
Heavy Phisical Activity						
Moderate	0.724	0.335	0.031	2.2	1.15	4.19
Light	0.879	0.387	0.023	2.7	1.36	5.49
Risk Consumption	-0.318	0.386	0.410	0.728	0.342	1.551
Low Dietary Fiber	-0.137	0.380	0.719	0.872	0414	1.838

DISCUSSION

As many as 31.87% prediabetic develop to tipe 2 DM. This study was also demonstrated by NHNES that 5-10% of prediabetic will be type 2 DM each year[9], during the 3 years 15-30% patient prediabetic will be suffer from DM[11]. This earlier study showed that impairing glucose level of type-2 DM (41%) were greater than impairing fasting glucose level (28%)[13].

Type-2 DM caused by lifestyle, i.e unhealthy consumption, lack of physical activity, smoking habit and alcohol consumption [14-15]. This study show that there were 47.3% of population have bad life style, i.e. smoking: 42% (men: 41%), less physical activity (moderate and light acrivity was 52% less intake of fruit (86, 8%) and vegetables (14.3%), fatty, sweety drinking and multiple proceded food 86.8%, fat/cholesterol/fried foods (15.8%) and chicken/meat/fish with procced by preservatives: (24%). The highest to lowest risk of lifestyle were found in Bugis (56.1%), Makassar (46.2%), and Toraja (25.0%) tribes.

Based on ethnicity, smoking habit is highest in the Toraja: 44%, Makassar: 22.9% and Bugis: 7.7%, it had relevance closely with the rank of insidence of type-2 DM, there were 54%, 52.9% and 50% respectively. Bivariable analysis show that there was no association between smokers and non-smokers against type-2 DM. Smoker and former smoker were more likely to be suffer from type-2 DM than non smoker, These results are consistent with earlier results that smoker had a risk on 43% developing type-2 DM than non-smokers (HR: 0.77 95% CI: 0.61 to 097)[14]. A cohort studies of Reis, et al.[16], show that non smoker had a lower risk to be type-2 DM (man : 43% RR 0.76 95% CI 0.72 to 0.80, and women 46% RR: 0.84 95% CI 0, 79-.84) than smoker. Similarly, a prospective cohort study by Cullen, et al.[17]showed that there was a strong relationship between smoking and type-2 DM, without controlling IMT. Those who never smoked had a 22% risk (HR: 1.2 95% CI 1.11 to 1.34) and current smokers had a 35% risk (HR: 1.35 95% CI: 120-151) higher to be type-2 DM than non-smokers.

However, the final modelling after controlled by the variable covariates, a significant association was found former smoking with type-2 DM (p: 0.01, HR: 2.195%CI: 1.16-4.12). A prospective cohort study of the Iowa Women's Health Study involving 41,836 women aged 55-69 years showed a significant association between smoking habit and the incidence of type-2 DM[17].

The effect of smoking on type 2 DM had not specificity relationship, it was caused by multifactorial, smoking only is not sufficient for type-2 DM incidenceNicotine caused insulin resistance by reduce insulin 10-40%[18], while cigarette smoke leads to reduced oxygen levels in tissues, raise cholesterol and blood glucose levels. According to Bilous [5], Cullen, et al. [17], Mann [19] smoking caused the incidence of type-2 DM by : (1). increasing insulin resistance, pancreatitis, and metabolic syndrome, (2) exacerbating the metabolism of glucose [20].

Multivariate analysis show that more frequent physical activity, the lower the risk of type-2 DM.. Stuckey show that physical activity reduce 60% risk of type-2 DM significantly and prediabetic can decrease fasting glucose levels of 0.5 mg/dL each minute[21]. According Midhet, et al., the less physical activity, the higher the risk of type-2 DM, people with light activity cant develop to type-2 DM (RR: 2.1 CI95% 1.2- 3.7)[22]. The study cohort of Reis, et al. showed that routine activity can lower risk of type-2 DM, 43% and 44% men and women respectively[16], so it is recommended to do physical activity at least 3 days a week.

Physical activity can involve the muscles and result in energy expenditure 21[16], muscles will use more glucose and burned glucose into energy[23], reduce body fat and improve insulin levels[21].

CONCLUSION

The high risk of life style group were more likely to be suffer from type-2 DM than the low risk group. Factors affected type-2 DM were found including smoking habit and (physical activity, while eating habit was not significant. Findings suggest to the health worker for giving people motivation to implement evidence-based of DM policy and strategies, prioritizing the improvement of physical activities and smoking cessation.

Conflict of Interest: Nil.

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Development, Validity and Reliability of Positive and Healthy Thinking Inventory (PHTI)

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ABSTRACT

The purpose of this study is to build, acquire content validity and reliability of Positive and Healthy Thinking Inventory (PHTI). PHTI is built on the integration Model of Positive and Healthy Thinking based on CBT by Aaron T. Beck[1] (1964) and Multidimensional Self Concept Model (MSCS) by Bracken[2] (1992) that stresses on the aspect of family, feeling, social, physical, efficiency and academic. Overall, the PHTI have 90 items (nine positive items and six negative items for each sub-scale) were divided into Sub Scale 1: Families (15 items), Sub Scale 2: Feelings (15 items), Sub Scale 3: Social (15 items), Sub Scale 4: Physical (15 items), Sub Scale 5: Skills (15 items) and Sub Scale 6: Academic (15 items). PHTI was given to nine expert panels which consists of five members of the academic and four practitioners of school counselors. PHTI has good overall content validity of 8.76 while the validity of the content based on Family sub-scale at 8.80, Feeling sub-scale at 8.70, Social sub-scale at 8.80, Physical sub-scale at 8.70, Efficiency sub-scale at 8.80 and Academic sub-scale at 8.70. Result shows that the PHTI has high content validity. Reliability of PHTI has been tested randomly towards 50 respondents consisted of Universiti Pendidikan Sultan Idris students. PHTI analysis of overall reliability is high at .950, while the sub-scale analysis also showed good results, namely .664 for Families, .750 for Feelings, .826 for Social, .836 for Physical, .817 for Efficiency, and .846 for Academic. Thus, reliability and validity of PHTI findings were good and helpful and could be applied in higher education institutions, workplaces and schools to produce a positive thinking and healthy human being.

Keywords: *Content Validity, Reliability, Positive and Healthy Thinking Inventory*

INTRODUCTION

Positive thinking is the thinking that is focused toward an individual's ability to evaluate every aspect of life from a positive angle. Essentially, individuals who are optimistic assess each situation from a positive perspective. Healthy mind also means positive thoughts which is proactive and productive, and the tendency to think of only good things (Khairul Azhar [3], 2014).

Inventory of healthy and positive thinking is the result of a combination of two types of theory, namely the theory of cognitive behavioral therapy (CBT) and Multidimensional Self-Concept Scale (MSCS). According to Dobson and Block[4](1998) cognitive behavioral therapy psychotherapy that gives priority to the interests of thinking and how thoughts affect feelings and our actions. According to Mohammad Aziz Shah[5]

(2008) problems that interfere with our lives are not because of our lack of skills or talent but it starts from the aspect of our thought patterns that responded to our feelings, behavior and later becomes our value. It makes your life feel meaningless all this while.

The multidimensional self-concept scale (MSCS) which was developed by Bracken[2] (1992) is designed to measure self-concept based on Multidimensional Self-Concept Model (MSCM). Self-concept is a key element of the formation and development of one's personality. Understanding one's self-concept will give us an understanding on various things about the human personality, thinking, behavior and his future life forecast.

Rosenberg[6] (1989) defines self-concept as the individual's thoughts and feelings as a whole, which

considers himself as the object. Rosenberg also believed that self-concept can be seen in a specific and general perspective as well. Ma'rof[7] (2001) stated that the self-concept is a person's feeling of personal identity who sees himself in terms of what he really is, what he has in terms of thinking, physical condition, shelter and anything related to himself. While Kuper and Kuper[8] (1976) defines self-concept as to how we see ourselves from the perspective of others.

Inventory of healthy and positive thinking was developed to test for individual thinking and measuring positive thinking and healthy thoughts for a more prosperous life based on three main elements, namely thinking, feeling and behavior. This inventory is important to identify whether a person's life means a lot to him and those around him. It can measure the level of positive thinking and a person's health in developing a better life.

RESEARCH METHODOLOGY

The study design was a descriptive study that aims to get the validity and reliability of the PHTI. The study involved three phases of the study, namely Phase 1: Development of PHTI, Phase 2: Validity of PHTI, and Phase 3: Reliability Analysis of PHTI.

Phase 1: Development of PHTI: PHTI development was based on the literature review. Based on previous in-depth studies, the integration approach of Positive and Healthy Thinking Model with Multidimensional Self Concept Model become the basis of PHTI development. The background inventory model based on Positive and Healthy Thinking and Cognitive Behavior Theory (CBT) models for which an individual whose positive thoughts will create positive emotions and actions can be seen as positive.

Phase 2: Obtaining Content Validity: In this phase, after the items PHTI were developed, PHTI were given to nine panel of experts to review the accuracy of the content. The panel consists of five members from institutions of higher learning and counseling practitioners who were counselors at schools. Revisions made by the panel of experts is to obtain the content validity of the PHTI. Validity is very important as a statement or an explanation is valid and true if they exactly represent the phenomenon characteristics that were attempt to be explained, theorized or described (Hammersley[9], 1995).

Phase 3: Analysis of Reliability: Next, the third phase is carried out to obtain the PHTI reliability value. Reliability is also often referred to portray stability and internal consistency (Creswell[10], 2005). The basis for the reliability value of the questionnaire were taken from Kerlinger[11] (1979) that a questionnaire has a α (alpha) value exceeding 0.6 at significant level of .05 is a good score. After PHTI obtain the proper value of the validity, it was administered to 50 students of Universiti Pendidikan Sultan Idris. The sample selection was based on simple random sampling method. The findings were analyzed using SPSS to obtain Alpha value for evaluating the reliability of PHTI.

The study subjects and study location: The study subject only involved in the second and third phase of the study. In the second phase, the study subjects were nine expert panels consisting of academics from higher education institutions and psychology and counseling practitioners in schools. As for the third phase of the study, a total of 50 students from Universiti Pendidikan Sultan Idris were selected to obtain the PHTI reliability data.

RESEARCH FINDINGS

Phase 1 Findings: Development of Scale, Sub Scale and Positive and Healthy Thinking Inventory Items.

The development of PHTI is based on a thorough literature review of sourced from books, articles and various international and local journals about/on positive and healthy thinking of individuals. This literature review study on healthy thinking which can affect mood and behavior of an individual. Next, the theoretical basis for the development of the PHTI main scale and sub-scale is the integration of Positive and Healthy Thinking Model with the Multidimensional Self-Concept Model. Based on the integration model, the developed PHTI contains 90 items which is divided into six subscales, namely Sub-scale 1: Family (15 items), Sub-scale 2: Feeling (15 items), Sub-scale 3: Social (15 items), Sub scale 4: Physical (15 items), sub-scale 5: Competencies (15 items) and Sub scale 6: Academic (15 items)

The findings of Phase 2: Content Validity of PHTI

Under the agreement of the expert panel, PHTI values are as shown in Table 1

Table 1: The overall validity and sub scale PHTI (n = 9)

Scale/Sub Scale	Item No.	Value (%)	Expert Result/ Decision
Overall PHTI	90	8.76 (87.6%)	Accepted
Family	15	8.80 (88.0%)	Accepted
Feeling	15	8.70 (87.0%)	Accepted
Social	15	8.80 (88.0%)	Accepted
Physical	15	8.70 (87.0%)	Accepted
Competencies	15	8.80 (88.0%)	Accepted
Academic	15	8.70 (87.0%)	Accepted

The findings of Phase 3: The reliability value of PHTI

PHTI reliability analysis are shown in Table 2.

Table 2: Overall reliability analysis and PHTI sub-scale (n=50)

Reliability Test	Item No.	Cronbach Alpha	Result
Overall PHTI	90	.950	Very High
Family	15	.664	Moderate
Feeling	15	.750	Moderate
Social	15	.826	High
Physical	15	.836	High
Competencies	15	.817	High
Academic	15	.846	High

Significant value at .05

Next, Table 3 shows the reliability analysis to test the quality of the developed positive and negative items. PHTI Item 1-15 is the sub-scale for Family, items 16-30 item is the sub-scale for Feelings, items 31-45 item is the sub-scale for Social, items 46-60 item is the subscales for Physical, items 61-75 is for the Competencies sub-scale and items 76-90 item is the sub-scale for Academic.

Table 3: PHTI Items reliability

No.	Item	Alpha Cronbach
1.	I think my parents are concerned about me	.649
2.	I think my family are friendly with each other	.629
3.	I think I am an important person in the family	.677
*4.	I think my family is not happy	.630
*5.	I think my parents do not trust me	.710
6.	I feel appreciated by every member of my family	.619
7.	I am proud of my family members	.647
8.	I am happy to be praised by both my parents	.682
*9.	I feel no fun being at home	.639
*10.	I think my family has troubled my life	.672
11.	My family members take care of each other	.618
12.	My family members help me when I am in trouble	.638
13.	My family members love to help each other	.618
*14.	My parents ignored me	.632
*15.	My family members do not care of my problem	.650
16.	I think I am a positive person	.734
17.	I think I can control myself well	.729
18.	I feel loved by everyone	.710
*19.	I feel my life is not happy	.722
*20.	I think everybody has a negative view of me	.724
21.	I feel very proud of myself	.735
22.	I feel loved by my friends	.721
23.	I feel happy to help others	.744
*24.	I feel worried about my life	.726
*25.	I feel that I have let myself down	.715
26.	I feel that reading the newspaper can add to my knowledge	.727
27.	I feel that daily exercise can boost my health	.725
28.	I feel that practicing prayers can soothe my soul	.747
*29.	I am sad when I am punished for the actions of others	.756
*30.	I am disappointed when friends accused me of taking their things	.811
31.	I think the people around me appreciate myself	.811
32.	I think I have many acquaintances	.818

Conted…

33.	I think I'm a shy person	.864
*34.	I think that everybody does not like me	.813
*35.	I think that other people are not interested in communicating with me	.793
36.	I feel that other people are happy being with me	.807
37.	I feel happy to help others in distress	.806
38.	I feel confident when everybody trusted me	.821
*39.	I feel ignored by friends when doing assignments	.799
*40.	I feel lonely when alone	.858
41.	People around me care about me	.819
42.	My friends help when I'm in trouble	.806
43.	People around me are very concerned about me	.797
*44.	People around me are not interested to talk to me	.794
*45.	Friends laugh at me when I gave the wrong answer	.806
46.	I think that I am attractive	.817
47.	I think I'm physically fit	.825
48.	I think I look good in everyone eyes	.817
*49.	I think I'm physically weak	.821
*50.	I think my figure is not attractive	.818
51.	I feel happy when my body is healthy	.828
52.	I am satisfied with how I look	.826
53.	I feel good when friends compliment me on my appearance	.841
*54.	I feel sad when I think of my increasing body weight	.833
*55.	I get frustrated when my friends say I am not attractive enough	.820
56.	I am active in sports	.825
57.	I like to jog in the evening	.821
58.	I am able to lift heavy objects	.857
*59.	I easily passed out if I over exert myself	.824
*60.	I get quickly tired when walking too fast	.816
61.	I think I can be successful in all areas	.815
62.	I think I am a logical-minded person	.799

Conted…

63.	I think I can generate good ideas	.816
*64.	I think I am an unfortunate person	.844
*65.	I think I'm a coward to face challenges	.816
66.	I feel that everyone appreciated my abilities	.802
67.	I feel I can control my emotions well	.792
68.	I feel happy when being able to complete a task	.799
*69.	I feel disappointed if I failed to solve my problem	.811
*70.	I felt disappointed when someone thinks that I am not able to complete the assigned task	.800
71.	I am a diligent in completing assignments	.794
72.	I am a good listener	.811
73.	I can complete the assignment in a timely manner	.803
*74.	I am lazy to take care of myself	.800
*75.	I am a failure in managing my time	.790
76.	I think I can master calculation well enough	.838
77.	I understand what I read	.834
78.	I can answer questions well in exam	.832
*79.	I think learning is troublesome	.841
*80.	I hardly think quickly	.866
81.	I feel proud when praised about the task that I have completed	.833
82.	I feel comfortable doing assignment in group	.848
83.	I feel good when I get the job done	.842
*84.	I felt stupid than others in a classroom	.833
*85.	I feel lazy to read books	.844
86.	I like to read books	.831
87.	I give full attention when teachers teach	.812
88.	I study hard to succeed	.834
*89.	I often late to class	.831
*90.	I annoy my friends while studying in classroom	.830

This shows that the built items quality is at a very good level and can be understood by respondents. This is in line with the opinion expressed by Mohd Majid[12]

(1998) who stated that the reliability coefficient of 0.60 or higher is acceptable.

CONCLUSION

Overall, this study has successfully established Positive and Healthy Thinking Inventory (PHTI) which have a high validity and reliability content. Therefore, PHTI can measure positive and healthy thinking of individuals which includes six major sub-scale i.e.; Family, Feelings, Social, Physical, Competencies and Academic. Analysis of each item contained in this PHTI shows that the quality of the items that are being developed is at a very good level and can be understood by the respondents. In conclusion, this study has shown that PHTI has high validity and reliability as well as produced an instrument to measure positive and healthy thinking in the individual self. This study could provide major implications for the world of psychology and counseling in Malaysia. The development of PHTI has a solid foundation based on extensive literature on definitions, concepts, factors and implications of positive and healthy thinking from various theories. Based on the findings which obtained high content validity and reliability value of PHTI, researchers suggested that PHTI can be implemented in all institutions of higher learning and the workplace to see positive thoughts of every individual in producing positive thinking and healthy generation.

Conflict of Interest: None

Ethical Clearance: Not required

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Histopathological Study of Endometrium in Abnormal Uterine Bleeding in Reference to Different Age Groups, Parity and Patterns of Bleeding

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ABSTRACT

Background: Abnormal uterine bleeding is a common reason for women of all ages to consult their gynecologist. This study was done to evaluate the endometrial causes of AUB and to determine the specific pathology in different age groups.

Aims: To study the histopathology of endometrial biopsies in patients presenting with AUB and its correlations with age, parity and bleeding pattern.

Results: The most common age group presenting with AUB was 41-45 yrs(36%) and the commonest pathology in this age group was simple hyperplasia . The commonest bleeding pattern was heavy menstrual bleeding and highest incidence was seen in multiparous women(74%).

Conclusion: Endometrial biopsy should be recommended during the work up of patients presenting with AUB to exclude organic pathology of endometrium.

Keywords: *Abnormal uterine bleeding(AUB), simple hyperplasia, heavy menstrual bleeding, endometrial biopsy.*

INTRODUCTION

The endometrium which lines the uterine cavity is one of the most dynamic tissues in the human body; an interesting tissue for histopathologic study. It is characterized by cyclic processes of cell proliferation, differentiation and death in response to sex steroids elaborated in the ovary.[1]

Abnormal uterine bleeding is defined as any bleeding pattern that differs in the frequency, duration and amount from a pattern observed during a normal menstrual cycle or menopause. It is a common problem having a long list of causes in different age groups.[2]

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The duration of normal menstrual cycle is 24-48 days. Average blood loss is 30 ml and it lasts for 4-6 days.[3] Blood loss greater than 80 ml is abnormal which results in anaemia. Prolonged flow is that which lasts for greater than 8 days.[4] Menorrhagia refers to bleeding occurring at normal intervals, but with heavy flow (>80 ml) or duration (>7) days.[5]

Abnormal uterine bleeding (AUB) is a common reason for women of all ages to consult their gynaecologist. It includes both organic and non organic causes of uterine bleeding. Endometrial biopsy or curettage could be a safe and effective diagnostic step in evaluation of abnormal uterine bleeding after ruling out medical causes.[6]

In June 2011 International Federation of Gynecology and Obstetrics (FIGO) gave PALM -COEIN classification for non-gravid women in reproductive age groups. The classification system is divided into nine categories and is arranged according to the acronym PALM-COEIN meaning Polyp, Adenomyosis, Leiomyoma,

Malignancy and hyperplasia, Coagulopathy, Ovulatory Disorders, Endometrium, Iatrogenic, and Not Classified respectively.[7]

This study was done to evaluate the endometrial causes of AUB and to determine the specific pathology in different age groups.

MATERIAL AND METHOD

Sample Size: 100 clinically diagnosed cases of AUB were included in the study.

Period of Study: 14 Months

Source of Data: Patients presenting with Abnormal uterine bleeding at OPD & IPD of SGT Hospital, Gurugram

Inclusion Criteria: Reproductive women in all age groups attending department of OBG with abnormal uterine bleeding.

Exclusion Criteria: Women with pregnancy complications, acute pelvic inflammatory disease, leiomyoma, hemostatic disorders and women on hormonal treatment for abnormal uterine bleeding were excluded.

METHOD

- The endometrial samples (endometrial curettage/ biopsy and hysterectomy specimens) sent to pathology laboratory were analyzed.

- The endometrial tissue was processed and stained with routine haematoxylin and eosin.

- A detailed histological study was carried out.

FINDINGS
Table 1: Age distribution pattern

Age Group	Number	Percentage
25-30	2	2%
31-35	8	8%
36-40	23	23%
41-45	36	36%
46-50	19	19%
>51	12	12%
TOTAL	100	

The maximum number of cases were seen in the age group of 41-45 years(36%) and minimum number of cases were seen in the age group of 25-30 years(2 %).

Table 2: Relationship of AUB with parity

Parity	Number	Percentage
Nulliparous	2	2%
(1-3)	74	74%
(>3)	24	24%
TOTAL	100	

The incidence of AUB was highest in multiparous women (74%) followed by grandmultiparous(24%) and least in nulliparous women (2%).

Table 3: Relationship of AUB with patterns of bleeding

Pattern of bleeding	Number	Percentage
Heavy menstrual bleeding	80	80%
Post menopausal bleeding	15	15%
Intermenstrual bleeding	2	2%
Heavy and prolonged menstrual bleeding	3	3%

Heavy menstrual bleeding was the most common symptom accounting for 80% of the patients followed by post menopausal bleeding(15%) , with the least being intermenstrual bleeding(2%).

Table 4: Pattern of distribution of Histopathological findings in AUB cases

Histological Findings	Number	Percentage
Proliferative	35	35%
Secretory	24	24%
Simple hyperplasia	33	33%
Complex hyperplasia	4	4%
Endometrial polyp	2	2%
Endometrial carcinoma	2	2%
TOTAL	100	

Proliferative phase was the most common finding accounting for 35% cases followed by simple hyperplasia 33% , secretory phase endometrium 24%, complex hyperplasia 4% , endometrial polyp and endometrial carcinoma 2% each.

Table 5: Histopathological findings among various age groups

Age groups	Reproductive group (25-40 yrs)		Perimenopausal group (41-50 yrs)		Postmenopausal group (>50 yrs)	
	No	%	No	%	No	%
Proliferative	13	13%	17	17%	5	5%
Secretory	12	12%	12	12%	0	0
Simple hyperplasia	7	7%	22	22%	4	4%
Complex hyperplasia	0	0	4	4%	0	0
E. polyp	1	1%	0	0	1	1%
Carcinoma	0	0	0	0	2	2%
Total	**33**	**33%**	**55**	**55%**	**12**	**12%**

The most frequent finding noted in reproductive age group was proliferative phase(13%). In perimenopausal women, the commonest finding was simple hyperplasia without atypia(22%) In post menopausal age, proliferative endometrium(5%) was most frequently found.

Table 6: Histopathological findings in correlation with parity:

	Nulliparous		Multiparous		Grandmultiparous	
	No	%	No	%	No	%
Proliferative	2	2%	25	25%	8	8%
Secretory	0	0	19	19%	5	5%
Simple hyperplasia	0	0	25	25%	8	8%
Complex hyperplasia	0	0	3	3%	1	1%
E. polyp	0	0	1	1%	1	1%
Ca	0	0	2	2%	0	0
Total	**2**	**2%**	**75**	**75%**	**23**	**23%**

There were 75 patients belonging to the multiparous group. Proliferative endometrium and simple hyperplasia was found in equal proportion in this group accounting for 25% each followed by secretory endometrium 19%, complex hyperplasia 3%, endometrial polyp 1% and endometrial carcinoma 2%. In nulliparous women, proliferative endometrium was the dominant finding. In grandmultiparous women, proliferative phase and simple hyperplasia was found in equal proportion.(8% each)

PHOTOGRAPHS
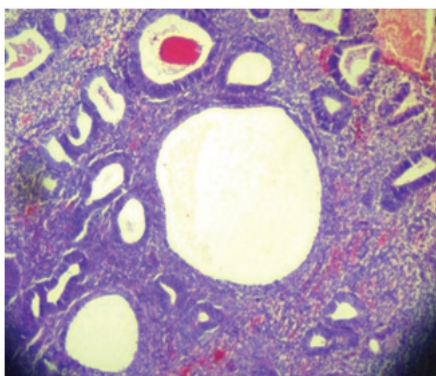
Figure 1: H&E (100X) Simple hyperplasia with cystically dilated glands and against compact stroma.
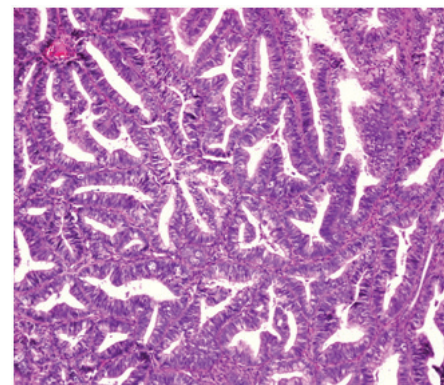
Figure 2: H&E (100X) Complex hyperplasia with back to back crowding of glands and compressed stroma.

DISCUSSION

Abnormal uterine bleeding continues to be one of the most common and perplexing problems in Gynaecological practice. It may present at any age between puberty and menopause. It may be associated with various kinds of histopathological findings in the endometrium.

The highest number of AUB cases in this study were noted in the 41-50 years age group which is in concordance with the results of the studies by Muzaffar[8] (2005), Saraswati [6](2011), Bhatta[4] (2012), Sujan[9] (2013) and Jagadale[10] (2015) whereas Jignasa[11] (2013) and Riju[12] reported maximum incidence in 31-40 years age group.

In the present study, the highest incidence of AUB was seen in multiparous women(74%) and lowest incidence was seen in nulliparous women(2%) which is in concordance with the results of the studies by Mehrotra et al[13] , Anusuya Das[14], Bhattacharji[15] . By these observations, it may be implied that incidence of AUB is highest in parous women in general and multipara in particular.

In the present study proliferative phase (35%) was found to be most common histologic pattern followed by simple hyperplasia without atypia (33%), secretory phase (24%),complex hyperplasia (4%), endometrial polyp(2%) and endometrial carcinoma (2%). It was in concordance with the study done by Bhatta S et al[4], Kunda J[10] ,Riaz et al[16] ,Bhonsale and Fonseca [17] ,Saraswati Doraiswami et al [6] ,Deshmukh et al[18] . However in the study done by Sajitha et al[19], the commonest pathology observed was endometrial hyperplasia in 39 (25%) patients, secretory endometrium in 26 (16.7%) patients, followed by proliferative and disordered proliferative endometrium in 19 (12.2%) patients each. Endometrial carcinoma was seen in 7 cases(4.5%).

CONCLUSION

In conclusion, endometrial biopsy in AUB is a simple,cost effective and appropriate method that provides accurate diagnostic yield. Endometrial causes are age related . The maximum incidence of AUB was noticed in 41-50 years of age group and the most frequent histopathological finding seen in this group was simple endometrial hyperplasia.

Hence endometrial biopsy should be recommended in patients presenting with AUB especially after the age of 40 yrs to exclude organic pathology of endometrium and to plan appropriate patient management.

Conflict of Interest: No conflict of interest exist on this research article in the institution.

Source of funding: self

Ethical Clearance: The study has been ethically approved by the institution.

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Development of Food Frequency Questionnaire for Pre-Obese and Obese Indian Women

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ABSTRACT

Background: A need based Food Frequency Questionnaire (FFQ) for pre obese and obese Indian woman has been developed for the quantitative assessment of nutrient intakes.

Objective: To develop Food Frequency Questionnaire (FFQ) for pre obese and obese Indian women.

Methods: Data on food intake was collected using the 3 day dietary record method from a sub sample of 50 subjects selected by random sampling method from a larger study group. Information was collected on the socio-demographic characteristics, lifestyle and dietary habits. The information pertaining to food items consumed as per 3 day dietary record was used in developing a suitable FFQ.

Main Findings: The FFQ contained 156 food items and were grouped into 14 food groups and 5 categories to measure food frequency. The FFQ contained a list of dishes along with the method of cooking.23% of the items in the FFQ were from the cereals and pulses group. The energy contribution by the proximate principles showed that carbohydrate contributes highest calories, followed by fat and the contribution by protein was the least in the study group.

Conclusions: Developing a FFQ for a target population is necessary for research purposes. The FFQ contained a list of the most commonly consumed foods by the subjects. Further studies have to be conducted for the validation of this FFQ in order to use it as a tool in the prevention and management of obesity.

Keywords: Diet Assessment, Food Frequency Questionnaire, Indian women, Obesity, Weight management

INTRODUCTION

According to the World Health Organization (WHO), obesity is one of the most common, yet among the most neglected, public health problems in both developed and developing countries. Based on the latest United Nations estimate, India, with 1.3 billion people is the second most populous country in the world and is currently experiencing rapid epidemiological transition[1, 2]. Dietary factors are the major modifiable factors through which many of the external forces promoting weight gain act[3].

In the field of nutrition, various methods are developed that are used to study the relationship between food and nutrient intake and health/disease occurrence. Such a method must be able to measure food consumption relatively easily, with sufficient accuracy and at a reasonable cost[4]. Methods such as single or multiple 24 hour dietary recalls, weighed diet records, self-reported diet history and Food Frequency Questionnaires (FFQ) have been used to assess dietary intakes in populations[5-7].

FFQ is a food list which depicts the frequency of consuming a particular type of food. Many FFQ's are available but without any consideration for cooking methods. It is advisable to consider cooking methods as well as the key nutrient content of foods when developing FFQ's. A single FFQ is not likely to capture the variations in dietary intakes in populations with different dietary habits[5, 8], hence a study was undertaken to develop a FFQ specifically targeting overweight or obese individuals and this FFQ post validity could be useful in future diet intervention studies.

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This paper describes the methods used to develop a FFQ for pre obese and obese Indian women.

MATERIAL AND METHOD

Subjects: To develop the FFQ, a sub sample of 50 subjects from various fitness centers in Bangalore was selected by random sampling from a larger study group. The sample was enrolled for the study considering the inclusion (age group of 25 years to 35 years, Body Mass Index(BMI) of more than 24.9,exercising for a minimum of 60minutes) and exclusion (normal BMI, age group below 25 years or above 35 years of age, women who were pregnant or lactating, sedentary lifestyle) criteria.

Methods: To develop the FFQ, the data was collected based on the 3 day dietary record of the subjects. Before obtaining the information, subjects were informed on how to record their food intake. They were asked to mention the ingredients in the dish, the time of consumption as well as estimate portions consumed. The portion sizes of food were recorded using standard household measures such as cup, glass and spoons.

Development of the Food Frequency Questionnaire (FFQ): The 3 day dietary record method alone may not be helpful in obtaining all the information pertaining to their food intake hence an open end questionnaire[5] was also used to obtain the additional information regarding their dietary intake.

The open end questionnaire included a set of questions such as intake of medical and dietary supplements, food consumption during special occasions, eating out, special diets or FAD diets they were currently following. Based on the information obtained the food items were grouped under different food groups. The method of cooking was also considered while grouping the foods.

The food items were grouped into food groups as per Nutritive Value of Indian Foods which is used as a reference point[9]. Additional groups such as junk foods and fast foods, special foods, meal replacers etc were also included. Composite dishes were assigned to a food group based on the ingredients present in the dish. For example, Idli is a dish prepared using ingredients that are a combination of a cereal and pulse and hence Idli was added into the food group Cereals and Pulses. The 3 vegetable groups namely, leafy vegetables, roots and tubers and other vegetables were categorized based on the method of cooking[8, 10].

Nutrient intake data from the 3 day dietary record were entered into the validated software 'DietCal' version 3·0 (Profound Tech Solution; http://dietcal.in/), which is based on values from the *Nutritive Value of Indian Foods[11]*. The data collected was then analyzed.

FINDINGS

Socio-demographic characteristics, lifestyle and dietary habits of the study group are shown in Table 1. The sample included 50 women, the average age of the study group was 30 years and their average weight was 70kg with a mean BMI of 27.7. The study group composed of 64% non-vegetarians as against 26% who were vegetarians. Among the study group 32 were drinkers and 15 were smokers.

Table 1: Characteristics of the study group

Sl. No.	Characteristics	n=50
1.	Age (years)	30 ± 3.4
2.	Weight (kg)	70.4 ± 8.5
3.	Height (cm)	159.2 ± 5.0
4.	BMI (kg/m^2)	27.7 ± 2.7
5.	Smokers	15
6.	Drinkers	32
7.	Vegetarians	13
8.	Ovo-vegetarians	5
9.	Non-vegetarians	32

The FFQ comprised of 156 items that included composite dishes and food stuffs, which were segregated into different groups. There were in total 14 groups. The groups were 1) Cereals and Pulses, 2) Leafy Vegetables, 3) Roots and Tubers,4) Other vegetables, 5) Nuts, Seeds and Dry Fruits, 6) Fruits, 7) Non Vegetarian items, 8) Milk and Milk Products ,9) Fats, Oils and Sugars , 10) Beverages , 11) Junk Foods and Fast Foods , 12) Snacks/ starters ,13)Special Foods and 14) Meal Replacers. The food items were listed under the food groups mentioned vide serial number 1, 7, 8, 10, 11, 12, 13 and 14.Only in the non- vegetarian group both the foods and method of cooking were mentioned. The 3 vegetable groups (serial number 2, 3 and 4) were categorized based on the method of cooking.

Table 2 shows the number of food items included under each food group in the FFQ. The highest number of food items are listed under Cereals and Pulses followed by Junk Foods and Fast Foods.

Table 2: Number of food items in the FFQ

Food Groups	Food Items	% Contribution
Cereals and Pulses	36	23
Nuts, Seeds and Dry Fruits	11	7
Fruits	9	6
Non-vegetarian items	9	6
Milk and milk products	7	4
Fats, oils and sugars	9	6
Beverages	20	13
Junk Foods and Fast Foods	22	14
Snacks/starters	16	10
Special Foods	14	9
Meal Replacers	3	2
Total	**156**	**100**

Table 3 shows the mean nutrient intake of the study group. The mean daily energy intake of the subjects was 1914 ± 260Kcal. The calorie contributions of the macronutrients are shown in Table 4. Carbohydrate (54%) showed the maximum contribution to energy intake as against protein which showed the lowest (16%). Total Fat contributed to 30% of the mean energy intake.

Table 3: Mean Nutrient Intake of the study group

Sl. No.	Nutrient	Intake (n=50)
1.	Energy (Kcal)	1914 ± 260
2.	Carbohydrate(g)	256 ± 54
3.	Protein(g)	68 ± 30
4.	Total Fat(g)	62 ± 18

Table 4: Calorie contribution of the macronutrients

Sl. No.	Macronutrient	% contribution
1.	Carbohydrate	54
2.	Protein	16
3.	Total Fat	30

CONCLUSION

In the present study we have developed a Food Frequency Questionnaire for pre-obese and obese Indian women. This study is the one of the first of its kind to have developed a FFQ specifically for pre obese and obese

Indian women. The study subjects were classified as pre obese and obese based on the BMI cut offs for Asians. The 3 day diet record method was used for measuring the food intake as this method is considered to be one of the most accurate methods to measure intake [12-15].

The FFQ contained 156 food items (including composite dishes and food stuff) in 14 food groups. The decision to add additional food groups such as fast foods and junk foods, snacks/starters and meal replacers was based on observation while collating the information obtained from the 3 day dietary record of the study group. The additional groups help in minimizing the possibility of missing important foods that are consumed by the target population. The FFQ also contained a list dishes along with the method of cooking as cooking methods also have an impact on nutrient levels[8].

Unhealthy eating has a direct association with nutritional status and is a risk factor for several chronic non-communicable diseases as well[6]. The diet should provide 50-60% of its calories from carbohydrate, minimum 20% from fat and 12-20% from protein[16]. The ratio of calorie contribution from carbohydrates, proteins and fats obtained from the 3 day dietary record of the study group were 54:16:30 which are in the normal range. However, the mean calorie intake of the study group was 1914 ± 260Kcal as against the required calorie intake of 1968 ± 78Kcal[17].

One of the limitations of this study is that the food list could be fine-tuned and made shorter by clubbing foods of similar nutrient content or by omitting foods that were not consumed by more than 15% of the population. Small food lists (less than 50 items) may underestimate food intake, and very long lists (more than 100 items) may tire respondents and overestimate food intake. [6, 18, 19]. In conclusion, the development of an FFQ should take into consideration whether the food list developed represents the population under study[18] and as recommended the FFQ developed contained a list of the most commonly consumed foods thereby representing the dietary habits of the study group. Furthermore, the FFQ needs to be validated before using it as a tool in the prevention and management of obesity.

Conflict of Interest: None

Ethical Clearance: The study was approved by the Institutional Ethical Committee of Smt. VHD Central Institute of Home Science, Bangalore.

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Low Maternal Hemoglobin Levels as Predictor for Low Birth Weight and Preterm Delieveries

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ABSTRACT

Background: Anemia in women during pregnancy has always been considered an important medical condition especially in developing countries. In this particular village of Punjab, during the regular visit in community, was seen an unusual pattern of females with very low hemoglobin giving birth to normal birth weight babies.

Aim: To establish the relationship between maternal hemoglobin with birth weight and preterm delivery.

Material and Method: A retrospective Cohort study was conducted in a rural primary health center, Hambran Village, Ludhiana, Punjab. Historic cohort of all the women registered and delivered during April 2014 till July 2015 were included in the study. Basic demographic details were obtained from the health record at the center and women were followed up till they delivered.

Results: The mean age of the study participants was 23.69 ± 3.69 years. Out of 172 children born, 20 (11.6%) were low birth weight. Being primigravida, preterm birth and number of ANC visits less than 3 were significantly associated with low birth weight of children. A positive correlation was found between maternal hemoglobin and birth weight of the babies but it was statistically insignificant (R= 0.101, p>0.05) whereas a significant positive correlation was seen between maternal weight gain and birth weight, (R= 0.301, p<0.05).

Conclusion: The prevalence of anemia during pregnancy is quite high in the study. Primigravida, preterm birth and less number of ANC visits were found to be significant factors for low birth weight. These are the key mediating factors that need to be considered and targeted public health interventions are required to improve birth outcome of infants.

Keywords: Anemia, Low birth weight, preterm

INTRODUCTION

Anemia during pregnancy is an important public health issue in developing countries[1–3]. During the visits to a rural community in Punjab, it was observed that antenatal women with very low hemoglobin were giving birth to normal birth weight babies. Adequate evidence

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to support iron supplementation in pregnancy for the specific purpose of raising birth weight or lowering the rate of preterm birth in similar communities does not exist. Anemia is one of the most prevalent nutritional deficiency problems afflicting pregnant women[4] and the extent to which it affects maternal and neonatal health is still uncertain. It has long been recognized that anemia is a major public health problem especially among poorer segments of the population in developing countries such as India, Pakistan and Bangladesh (World Health Organization 1992). Anemia that complicates pregnancy threatens the life of both the mother and the foetus. Maternal anemia is commonly considered a risk factor for poor pregnancy outcome[5]. Some studies have demonstrated a strong association between low

hemoglobin before delivery and adverse outcomes[6]. However, others have not found a significant association. Thus, there is insufficient information to assess the overall adverse impact of anemia during pregnancy. Our aim was to determine the relationship between maternal anemia and perinatal outcome of Low birth weight (LBW) which is an important determinant of childhood morbidity and mortality. Child's birth weight is a significant factor which determines vulnerability for risk of childhood illnesses and childhood survival. Consequently, children who are born with weight less than 2.5 kg are vulnerable for dying during their early childhood[7–9]. Moreover, research highlight strong associations between LBW and increased risk of infections, malnutrition, poor academic performance and problems related to mental, behavior and learning difficulties during childhood [8]. Low birth weight has been defined by the World Health Organization (WHO) as weight at birth of less than 2,500 grams. This practical cut-off for international comparison is based on epidemiological observations that infants weighing less than 2,500 g are approximately 20 times more likely to die than heavier babies[10].

MATERIAL AND METHOD

Study area: Hambran Village, with a population of 3493 is the 20th most populous village, in district Ludhiana in Punjab, India. Total geographical area of Hambran village is 12 km² and it is the 7th biggest village by area in the sub district.

A primary health center is located in the centre of village which provides comprehensive health care services to the community. The primary health centre is adequately staffed with ASHA and ANM'S to provide village outreach services. Regular home visits and priority visits to the houses of pregnant women ensures health record maintenance and quality of data collected.

Study design: A retrospective cohort study was conducted and a cohort of all the women who delivered during the period from April 2014 till July 2015, were included in the study. We collected epidemiological data including antenatal and delivery details of the women from the health records maintained by the health staff at the PHC.

Inclusion Criteria: The study included only the registered cases having three or more ante-natal visits and those having live births only either through normal, assisted, instrumental or Caesarean section deliveries.

Exclusion Criteria: Records of women without three or more ANC's were excluded from the study.

Methodology: Out of 229 women registered, 172 (75.1%) fulfilled the inclusion criteria. The data from the records was entered in Epi-Data version 3.1 on a pre-designed questionnaire that recorded age, education, caste of family, hemoglobin estimation at first, second and third antenatal visit, gestational age at delivery and perinatal outcome (live birth, stillbirth, IUD). Gestational age was calculated from first day of last menstrual period. Preterm delivery was defined as delivery after 24 and before 37 completed weeks of gestation. IUD was defined as foetus without cardiac activity, confirmed on ultrasound, at any time after 24 weeks of pregnancy. Stillbirth was defined as the death of a live foetus during the birth process. We used definitions of anemia and low birth weight (LBW) according to recommendation from the WHO. Hemoglobin level below 11gm/dl in pregnant women constitutes anemia and hemoglobin below 7gm/dl is severe Anemia. According to WHO, LBW is defined as less than 2,500 g (up to and including 2,499 g). Infants weighing less than 2,500 g, or further divided as very LBW (less than 1,500 g) or extremely LBW (less than 1,000 g)

Data analysis: The data was analyzed in SPSS version 21. Frequencies were determined; Pearson's chi square test was applied for categorical data and Spearman correlation was used to describe relationship between hemoglobin and maternal weight to birth weight of the baby.

RESULTS

The mean age of the study participants was 23.69 ± 3.69 years. Mean parity was 1.87 ± 0.981 and mean birth weight of the children born was 2.85 ± 0.51 kg. Out of 172 children born, 20 (11.6%) were LBW and 183 (89.5%) children were normal weight babies.

Among study participants, only 1 participant had a hemoglobin level in the normal range, 9.3% had mild anemia, 80.2% had moderate and 9.9% had severe anemia. 45.3% women were primigravida and rest 54.7% were multigravida. Twenty (11.6%) children born had LBW (LBW), 50 (29.6%) born were preterm, 80.8% children were born through normal delivery and only 19.8% were born through LSCS, (Table 1).

Being primigravida, preterm birth and no of ANC visits less than 3 were statistically significant associated with LBW of children. Other factors including, severity of anemia, maternal education, and belonging to

schedule caste family were not significantly associated with the LBW outcome (Table 2).

Spearman's correlation was applied and a positive correlation found between maternal hemoglobin and birth weight of the babies but it was statically insignificant, with a correlation coefficient R= 0.101 (p>0.05) (Figure 1) whereas there was a significant positive correlation seen between maternal weight gain and birth weight of the cabbies born, correlation coefficient, R= 0.301 (p<0.05) (Figure 2).

Table 1: Descriptive data representing the basic characteristics of the study participants.

Determinants	N = 172	
Sex of the Child		
Male	85	49.4%
Female	87	50.6%
Type of Delivery		
Normal	139	80.8%
LSCS	33	19.2%
Gestation		
Preterm	50	29.1%
Normal	122	70.9%
Parity		
Primigravida	78	45.3%
Multigravida	94	54.7%
No of ANC		
< 3	17	9.9%
> 3	155	90.1%
Anemia		
No Anemia	1	0.6%
Mild	16	9.3%
Moderate	138	80.2%
Severe	17	9.9%
Education		
Illiterate	32	18.6%
Primary	47	27.3%
Intermediate	61	35.5%
Higher	9	5.2%
Graduate	15	8.7%
Postgraduate	8	4.7%
Type of family		
Schedule Caste	66	38.4%
Non Schedule Caste	106	61.6%

Table 2: Bivariate analysis of various determinants and LBW

Determinants	All	LBW	NBW	P Value
Sex of The Child				
Male	85	11 (12.9%)	74 (87.1%)	0.595
Female	87	9 (10.3%)	78 (89.7%)	
Type of Delivery				
Normal	139	17 (12.2%)	122 (87.8%)	0.613
LSCS	33	3 (9.1%)	30 (90.9%)	
Gestation				
Preterm	50	16 (32.0%)	34 (68.0%)	0.000*
Normal	122	4 (3.3%)	118 (96.7%)	
Parity				
Multigravida	94	6 (6.4%)	88 (93.6%)	0.018*
Primigravida	78	14 (17.9%)	64 (82.1%)	
No of ANC				
< 3	17	5 (29.4%)	12 (70.6%)	0.016*
> 3	155	15 (9.7%)	140 (90.3%)	
Anemia				
No Anemia	1	0 (0.0%)	1 (100%)	
Mild	16	2 (12.5%)	14 (87.5%)	0.710
Moderate	138	15 (10.9%)	123 (89.1%)	
Severe	17	3 (17.6%)	14 (82.4%)	
Education				
Illiterate	32	2 (6.2%)	30 (93.8%)	0.210
Primary	47	7 (14.9%)	40 (85.1%)	
Intermediate	61	6 (9.8%)	55 (90.2%)	
Higher	9	1 (11.1%)	8 (88.9%)	
Graduate	15	1 (6.7%)	14 (93.3%)	
Postgraduate	8	3 (37.5%)	5 (62.5%)	
Type of family				
Schedule Caste	66	4 (6.1%)	62 (93.9%)	0.072
Non Schedule Caste	106	16 (15.1%)	90 (84.9%)	

$$y = 24.05x + 2652.$$
$$R^2 = 0.002$$
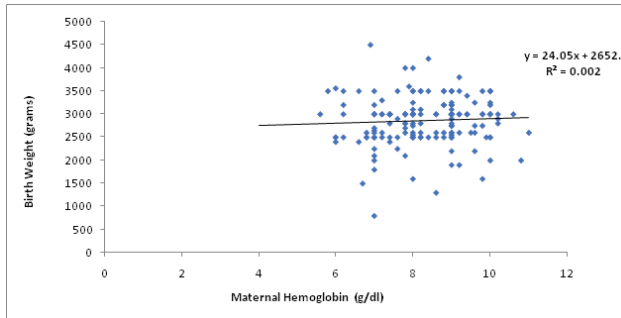
Figure 1: Correlation graph between maternal hemoglobin and birth weight of the babies

$$y = 0.016x + 2.064$$
$$R^2 = 0.094$$
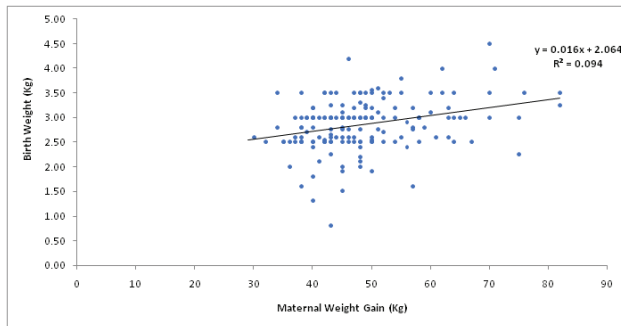
Figure 2: Correlation graph between maternal weight gain and birth weight of the babies

DISCUSSION

Prevalence of anemia in pregnancy shows great variations in different parts of the world. Studies from industrialized countries show that 2.0% - 45.0% of pregnant women are having anemia which is generally higher in developing countries (5.0%-90.0%) [11,12]. The prevalence of anemia in our study population was 99%. The huge prevalence in a rural community is in line with other studies reporting the similar result. A study conducted in rural Haryana showed the prevalence of anemia during pregnancy to be 98%[13].

In this study, we did not find any statistically significant difference for birth weight in children born to anaemic women. A meta-analysis of 10 studies by Xiong *et al.* reported similar findings[14] and a plausible explanation could be that anemia due to physiological fall in hemoglobin levels during late pregnancy due to normal plasma volume expansions[15,16]. Higgins *et al* [17] *reported* an inverse association between birth weight and hemoglobin levels during late pregnancy (*P < 0.01*).

In the current study, a positive correlation was found between maternal hemoglobin values and birth weight of the babies but was not statistically significant.

However, in many studies done earlier, hemoglobin was identified as an important biomarker contributing to birth weight [18,19] and a U- shape relationship between maternal hemoglobin and birth weight of the babies was established [20].

According to Rasmussen et al., there are several factors which might lead to both LBW and the severity of the anemia and only supplementation of anemic or non-anemic pregnant women with iron, folic acid or both does not appear to increase birth weight or the duration of gestation[21].

Relationship between anemia and LBW seems to be complex and further investigations are needed to investigate associations between anemia and LBW in India.

Primigravida, preterm birth and number of ANC visits less than three were significant factors associated with LBW of the babies in this study. These findings were similar to previous studies [19,22,23]. We also found a positive significant correlation between maternal weight and birth weight of the baby, confirming that maternal weight gain in pregnancy does result in higher birth weight infants.

This study found a strong association between lack of antenatal care and LBW and the results were in agreement with previous studies [24,25]. Antenatal care includes routine monitoring of height and weight gain, identification of medical maternal or fetal problems, counseling against tobacco or substance use; provides psychosocial support, nutritional advice, and early intervention which may reduction adverse pregnancy outcomes including LBW. Lack of access to ANC could be influenced by many factors including lower socio-economic status and poor knowledge. Therefore, utilization of ANC should be further investigated to understand obstacles and opportunities to improve services[26].

The social patterning of birth weight for children born to Schedule caste and Non-Schedule caste families was absent in this study. The results were different from other studies conducted earlier, which reported that children born to a scheduled tribe family were different from those born to general caste families[27].

CONCLUSIONS

Primigravida, preterm birth and less number of ANC visits were found to be significant factors for LBW in our study. These are the key mediating factors that need to be considered to improve birth weight of infants. Targeted public health interventions including more care to primigravida, treating clinical and subclinical infection in time to prevent spontaneous preterm labor, and regular follow up of high risk pregnancies are required to improve the birth outcome.

Implications for public health: Consideration should be given to lowering the hemoglobin cut-off value for anemia during pregnancy because optimal birth outcomes may be achieved at hemoglobin values in the range currently designated as anaemic.

Limitations: The major limitation of this study was the absence of the control (non-anemic) group and small sample size. This was perhaps due to very high prevalence of anemia in the population and also the missing data in the records due to non-follow up of cases.

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Source of funding: Self

Conflict of Interest: Nil

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Stress Perception and Its Psycho-Social Attributes in a Rural Community of Northern India

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ABSTRACT

Introduction: Stress is the physical, mental and emotional response to a stress-causing factor or 'stressor; it is the perception of the event that has an implication on subsequent coping and health. Psychosocial stressors in the rural community need to be explored as these have great scope for early intervention. The objective of this study was to estimate the prevalence of perceived stress and identify the causes of psychosocial stress in a rural population.

Methods: A cross-sectional study was carried out among individuals between the age of 30 -60 years. Two hundred people were selected by systematic random sampling from a rural community. Validated scale for perceived stress (PSS) was administered and causes of stress were assessed using a structured questionnaire.

Results: The mean score of perceived stress was 16.38 ($\pm$ 7.98). The prevalence of perceived stress was found to be 65.5% among the study participants. Belonging to a schedule caste family, female gender, low socio economic status, unemployment, type of employment, and history of presence of comorbid illness were associated significantly with perceived stress. Relationship issues (76%) was the most common stressor in the community followed by financial issues (64%).

Conclusion: The study participants show high prevalence of stress and depression in the community.People should be encouraged to improve stress coping techniques and carry out positive healthbehaviors for coping stress.

Keywords: Rural, Stress.

INTRODUCTION

The World Health Organization (WHO) defines Mental Health as 'a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community[1].

Different mental disorders are generally characterized by a combination of abnormal thoughts, perceptions, emotions, behavior and relationships with others. Stress, Genetics, nutrition and exposure to environmental hazards are also contributing factors to them[2].

Stress is the physical, mental and emotional response to a stress-causing factor or 'stressor'[3]. It is also defined as an interactive process between an individual and his environment, and it is the perception of the event rather than the event itself that has an implication on subsequent coping and health[4].

Perceived stress can be viewed as an outcome variable measuring the experienced level of stress as a function of objective stressful events, coping processes and personality factors[5]. Perceived stress is the feelings or thoughts that an individual has about how much stress they are under at a given point in time or over a given time period. It can be described as the association between the environment and the present condition of

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the person. The response to the relationship tends to be distress or anxiety[6]. It is often seen that psychological stress occurs when an individual perceives that external demands of daily life exceed his or her adaptive capability[7] and It depends on the individual's responses to events that can cause an overload from perceived stress, possibly resulting in negative effects[8]. As levels of distress increase, the ability of the individual to cope or adjust is no longer adequate, which may lead to a higher occurrence of illness, injury, or disease[9].

A study conducted in geriatric population in Ludhiana, concluded that psychosocial stress was more in rural geriatric population than in urban geriatric population. These problems may lead to the expression of mental disorders, such as depression and anxiety disorders and somatic symptoms[10,11]. A study in rural south India shows that Psychosocial stress and social isolation, rather than psychiatric morbidity, are the risk factors for suicide which makes the enumeration of stressors in community, even more important[12].

Depression is one of the outcomes of chronic stress which contributes to the global burden of disease and effects people in all communities across the world.A holistic approach offers potential means for resolving these problems[13–15]. This study aims to identify the common stressors in a rural setting that causes increased stress perception.It will help to plan and establish appropriate integrated psychosocial intervention models that target multi- dimensional individual and community level variables simultaneously, thereby improving treatment outcomes and medical adherence.

METHODOLOGY

Objectives:

1. To estimate the prevalence of perceived stress and its psycho- social attributes

2. To identify the causes of psychosocial stress in a rural population.

Study Design: Cross – Sectional Study

Study Setting: The study was conducted in a rural community in Lalton Kalan village, Ludhiana district.

Method: The study was conducted over a period of two years, from Oct 2014 till October 2016. Stratified systematic random sampling was performed, which was stratified for gender. A list of all the 1200 families was obtained from the records maintained by ANM staff. Participants in the list were interviewed till our sample size criteria were met. Every participant was interviewed only once.

Sample: A total of 200 participants comprising of 96 males and 104 females were interviewed using a standardized questionnaire.

Inclusion criteria: Participant's age between 30 to 60 years and who gave written consent.

Exclusion criteria: Patients Incompetent for interview (Severe cognitive impairment, dementia or terminal illness) and imminent suicidal tendency. Patients with minor psychiatric conditions and stable with treatment were not excluded.

Study Tools: A structured questionnaire was used to collect information regarding demographic and clinico-social characteristics of study participants. Information included caste, type of family, marital status, education level and employment status[16], A proxy measure of socioeconomic status, health perception, history of mental illness, family history of mental illness, details of comorbid illness and addictions.

The Perceived Stress Scale (PSS) which has been widely used psychological instrument for measuring the perception of stress, was also used to asses stress[17]. There are four negative and six positive questions for which the subjects were required to choose from a scale of 5 alternatives on a 0-4 scale. The 4 negative items were reverse scored and added up to the six positive items to get the total score[18].Total scores may range from 0-40, with the higher scores indicating greater perceived stress.A cut off score ≥ 13 on PSS scale was used for defining a case having perceived stress[19]. Data was collected and entered into Epidata software version 3.1 analyzed using SPSS Ver. 21.

RESULTS

The mean score of perceived stress in our study population on PSS was 16.39 ± 7.98; the minimum and maximum score reported being 0 and 36 respectively. The mean age group of study participants in our study was 43.52 ± 8.62 Years.

The prevalence of perceived stress was found to be 65.5% among the study participants. Belonging to a schedule caste family, female gender, low socio economic status, unemployment, type of employment, and history of presence of comorbid illness were associated significantly with perceived stress (Table1).Subjects with substance abuse were less likely to perceive stress and the association was statistically significant.

Relationship issues (76%) was the most common stressor in the community followed by financial issues (64%), Health issues (56%), issues at work (55%), stressful life events (50.5%) and substance abuse (14%) respectively (figure1).

Table 2 shows the difference in perception of stress among males and females related to various psycho-social causes in the community. In general, stress was seen higher in females.

Work related issues: Among 110 participants who were stressed due to work related issues, 45.5% were females and 54.5% were males. (OR= 0.55, CI= 0.31- 0.97, p<0.05).

Relationship issues: Among 152 participants who were stressed due to relationship issues, 57.9% were females and 42.1% were males (OR= 2.75, CI= 1.39-5.43) and the difference was statistically significant.

Health issues: Among 112 participants who were stressed due to various health problems, 53.6% were females and 46.4% were males (OR= 1.15, CI= 0.65-2.01) and the difference was not statistically significant.

Stressful Life events: Among 101 participants who were stressed adverse life events 66.3% were females and 33.7% were males (OR= 3.30, CI= 1.84-5.89) and the difference was statistically significant.

Financial Issues: Among 128 participants who were stressed due to financial concerns, 54.7 % were females and 45.3% were males (OR= 1.34, CI= 0.75-2.40) and the difference was statistically significant.

Substance abuse issues: Among 28 participants who were stressed due to substance abuse problems, 67.9% were females and 32.1% were males (OR= 2.16, CI= 0.92-5.04) and the difference was not statistically significant.

Table 1: Specific prevalence of perceived stress according to various factors

Variables	Entire Group N = 200	Perceived Stress present N = 62	Perceived Stress Absent N =	Chi Square p-Value
Type Of Family				
Nuclear	85	60	25	X^2 = 1.694 p = 0.193
Joint	115	71	44	
Caste Of Family				
Schedule Caste	99	72	27	X^2 = 4.53 p = 0.033
Non SC	101	59	42	
Gender				
Male	96	50	46	X^2 = 14.70 P<0.001
Female	104	81	23	
Age categories				
30-40 Years	86	58	28	**X^2 = 1.35 p = 0.246
41-50 Years	65	45	20	
51-60 Years	49	28	21	
Socio Economic Status				
Low	62	44	18	**X^2 = 3.86 p = 0.049
Middle	68	48	20	
High	70	39	31	
Marital Status				
Married	190	125	65	X^2 = 0.14 p = 0.707
Unmarried/ Widowed	10	6	4	
Education				
Illiterate	36	26	11	X^2 = 11.47 p = 0.043
Primary	49	36	13	
Secondary	74	43	31	
Senior Secondary	20	9	11	
Graduate	14	11	3	
Post Graduate	6	6	0	
Employment Status				
Employed	100	56	44	X^2 = 7.98 p = 0.005
Unemployed	100	75	25	

Conted…

Occupation				
Unemployed	9	6	3	
Unskilled	58	31	27	$X^2 =$ 13.34 p = 0.010
Self Employed	23	17	6	
Professional	19	8	11	
Housewife	91	69	22	
History Of Mental Illness				
Present	23	19	4	$X^2 =$ 3.36 p = 0.067
Absent	177	112	65	
Family History of Mental Illness				
Present	40	26	14	$X^2 =$ 0.01 p = 0.941
Absent	160	105	55	
Co-morbid Illness				
Present	73	55	18	$X^2 =$ 4.93 p = 0.026
Absent	127	76	51	

Conted…

Addiction				
Present	59	32	27	$X^2 =$ 4.69 p = 0.03
Absent	141	99	42	
Stress Coping				
Present	119	86	33	$X^2 =$ 5.95 p = 0.015
Absent	81	45	36	
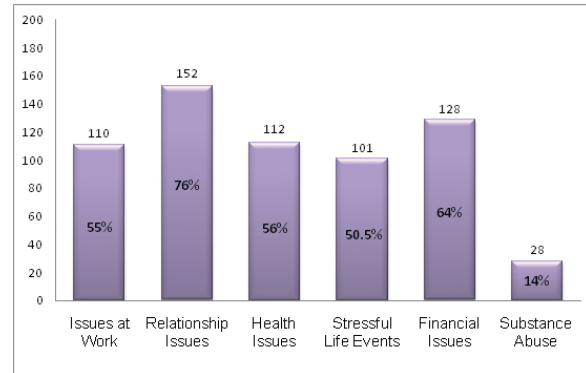
Figure 1: Distribution of various psycho-social causes of stress

*Psycho-social causes were assessed on a multiple response scale& therefore, n>200.

Table 2: Gender wise distribution of various psycho-social causes of stress

	Work n=110	Relationship issues n=152	Health issues n=112	Stressful Life Events, n=101	Finance, n=128	Substance Abuse issues, n=28
Female	50 45.5%)	88 (57.9%)	60 (53.6%)	67 (66.3%)	70 (54.7%)	19(67.9%)
Male	60 54.5%)	64 (42.1%)	52 (46.4%)	34 (33.7%)	58 (45.3%)	9(32.1%)
Odds Ratio	0.55	2.75	1.15	3.30	1.34	2.16
CI	0.31-.977	1.39- 5.43	0.65- 2.01	1.84- 5.89	0.75- 2.40	0.92-5.04

DISCUSSION

In the present study, prevalence of perceived stress was found to be 65.5% among the study participants which was similar to the findings of *Kaur et al.* who reported 73.3% and *Wiegner et al.* who reported 59% of stress among the study population[11,20]. People in the age group of 40-50 years had maximum stress and this was similar to the findings by *Klapow et al.*[21]who reported that younger patients were at higher risk for psychological disorders. However a study by *Bener et al.* [22] reported that older people were at higher risk of mental disorders including stress.

Belonging to a schedule caste family, female gender, low socio economic status, unemployment, type of employment, and history of presence of comorbid illness were associated significantly with perceived stress (Table 1). Similar to the findings of our study, *Kouzis et al.* showed that low/middle levels of income and female gender were positively correlated and higher levels of education were negatively associated with perceived stress[23]. Few other studies showed that unemployment and low income were associated with a higher prevalence of psychological distress[24,25]. We also found in our study that subjects with substance abuse were less likely to perceive stress and the association was statistically significant. This was contrary to the results of other studies which reported positive association between stress and alcohol or substance abuse[26–29].

In the present study, the various psychosocial causes of stress including work issues, relationship issues and stressful life events were significant causes of stress.

Financial issues were a common cause of stress but were found statistically insignificant. 53 (26.5%) participants mentioned about the presence of suicidal ideation.

CONCLUSION

The study revealed a substantial prevalence of stress disorders (65%) in the rural community. Common causes of stress included work issues which were more common in men and others including, relationship issues and stress full life events which were two to three times more common in females. Belonging to a schedule caste family, female gender, low socio economic status, unemployment, type of employment, and history of presence of comorbid illness were associated significantly with perceived stress.

The finding from our study explicates the urgent need to improve stress coping techniques among people. It is important to encourage people to carry out positive healthbehaviors for coping as opposed to negative ones. Further research should be carried to establish the causal mechanism of stress.

LIMITATIONS

A major limitation of this study is that the prevalence estimation is through a screening tool rather than a definitive diagnosis by a psychiatrist. The cross sectional study design qualifies for only a one-time view of the variables eliminating the ability to observe the causal mechanism of stress over a period of time and the study covered only one village of Lalton Kalan and the results cannot be generalized to the entire rural population.

Conflict of Interest: Nil

Ethical Clearance: Taken from Institutional Ethical Committee

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What Hampers Infection Control Practices in Intensive Care Unit (ICU) of a General Hospital

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ABSTRACT

Hospital associated infections (HAI) have been a scourge in ICU care, responsible for preventable morbidity and mortality. This study conducted in a small hospital, brings out that, not abiding by relatively simple rules and procedures hampers infection control. Sub-standard knowledge and poor practices regarding hand washing, non-use of caps, gloves and gowns, misuse of slippers, poor BMW disposal, non-notificatopn of HAI are the easily correctable causes of HAI in an ICU setting. Lack of hand-rub/sanitizers and emergencies were cited as causes of not washing hands. Judicious use of urinary catheters is emphasised. Immunization, linen-hygiene, HAI notifications and SOP utilization too was lacking. Regular training, continued medical education, accountability and assertion from HAI committee need to persist if we have to control HAI effectively.

Keywords: *Hospital Associated/Acquired Infection, HAI, Nosocomial infections, Hand hygiene, ICU*

INTRODUCTION

"The first requirement of any hospital is that it does the sick no harm"

–Florence Nightingale

Infection control practices are of paramount importance in any healthcare setup for prevention of Hospital Associated Infections (HAI). HAI are a major setback to any organization and the patients alike. HAI or nosocomial infection, can be defined as "infection acquired in hospital by a patient who was admitted for a reason other than that infection which was not present or incubating at the time of admission. This includes infections acquired in hospital but also appearing up to 72 hours after discharge". HAI result in increased morbidity and mortality, longer hospital stay and disability. World Health Organization (WHO) estimates that approximately 30% of patients are affected by HAI with associated morbidity and mortality[1,2]. HAI are either endogenous or exogenous[3].

Many factors promote infection among hospitalized patients like decreased immunity, medical procedures and invasive techniques drug-resistant bacteria crowded hospitals and poor infection control practices. HAI could be prevented by following infection control procedures that include: hand hygiene, personal protections, judicious equipment use, sterilization, waste management, cleaning and disinfection.[4]

Given the above implicit factors related to HAI, no matter how advanced and developed is the hospital, incidence of HAI is a necessary evil. Now, it is up to the hospital staff to be always vigilant and conscoius, so that the HAI could be averted. While it may be perceived that large hospitals are answering these issues well, through well orchestrated HAI control mechanisms, that involve training, CMEs, statutes and laws, inspections and accreditation cycles; it is the smaller hospital that is at a disadvantage of being sidetracked in terms of the above attributes, where prevention of HAI could be salvaged. In view of the above, it was considered prudent to take up this study at ICU of a small hospital with the aim of assessing the infection control practices followed there. The major factors hampering HAI control and promoting

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non-compliance of infection control measures amongst doctors and nurses were thus studied.

MATERIAL AND METHOD

This cross-sectional analytical study was conducted using a structured questionnaire admistered on medical and nursing staff working in ICU of a 200 bedded general hospital in Maharashtra. All the 16 doctors (senior residents, post-graduates, junior residents) and 28 nurses nurses (sisters-in-charge, staff nurses, CSSD in-charge and nursing superintendent) involved in patient care at ICU in the month of May 2016 participated in the study. The respondents filled up a structured questionnaire and returned on same day to avoid response bias. Questionnaire was based on WHO and CDC, HAI guidelines and was pre-tested. It included demographic details (age, sex, professional qualification and experience), infection control protocols (including knowledge/practice regarding infection control in ICU, personal protective measures, post-exposure prophylaxis) and hospital environment sanitation (including blood spillage and biomedical waste management). Statistical software SPSS was used to analyse results.

FINDINGS

The results pertaining to major factors responsible for non-compliance of infection control measures, ie. awareness, practices and management support are enumerated below.

Knowledge on Transmission and Prevention of HAI: Table 1 summarizes responses on awareness of doctors and nurses on transmission of HAI, preventive measures, immunization and linen-hygiene. Most doctors believed that HAI spreads through cross-transmission while most nurses believed it spreads through environment. Majority agreed that hand washing played major role in preventing HAIs. Use of personnel protective equipment was also considered important. Majority felt that use of urinary catheter, only when indicated, can reduce infection rates, while two-third of staff gave importance to documenting dates of catheter insertion/removal. 93% doctors and 67% nurses felt that hepatitis B vaccination should be mandatory. Only 75% doctors felt TT vaccination to be mandatory.

Table 1: Knowledge on Modes of Transmission & Preventive Measures of HAI

	Doctors (n=16)	Nurses (n=28)
Major Modes of Transmission		
Self Transmission	7 (43%)	14 (50%)
Cross Transmission	14 (87%)	6 (21%)
Transmission by Environment	9 (56%)	22 (78%)
Important preventive measures		
Hand Hygiene	15 (93%)	23 (82%)
Personal protective equipment	12 (75%)	15 (53%)
Use of urinary catheter only when indicated	13 (81%)	21 (75%)
Documenting catheter insertion/removal dates	11 (67%)	17 (59%)
Immunisation for health care staff		
Hepatitis B vaccination	15 (93%)	19 (67%)
TT injection	12 (75%)	19 (67%)
Linen Hygiene amongst Nurses		
Don't shake used linen (to prevent germ transmission)	-	16 (57%)
Ensured soiled linen bleach-washed, dried then sent to laundry	-	10 (35%)

More than half the nurses didn't shake used linen, about one third 'sometimes' did that and 10% had no clue about it. One third the nurses ensured soiled linen be put in bleach, washed, dried and then sent to laundry, while the rest either sent it directly to laundry or had no idea of it.

Knowledge and Practices on Bio-Medical Waste (BMW) Management: Even though majority of subjects agreed that waste must be segregated at source; only 60% doctors and 54% nurses were able to enlist various colour codings recommended for segregation of waste. Half of doctors (51%) and nurses (45%) knew about equipment used for BMW management. Use of Sodium Hypochlorite in laboratories for disinfecting liquid waste was agreed upon by most subjects.

Most (89%) doctors and nurses (91%) endorsed that they don't recap/bend needles before discarding. Majority of subjects (82% doctors and 76% nurses) discarded disposable needles/sharps into puncture resistant

containers. Two thirds of doctors (63%) and 57% nurses would cover blood or body fluid spills with 1% sodium hypochlorite for 10 minutes and then mop dry.

Basic Hygiene Practices: Basic hygiene practices like hand washing, use of slippers, ICU uniforms and caps, etc were ascertained. (Table 2)

Use of Slippers and caps: Most of the staff (75% doctors and 87% nurses) endorsed that ICU slippers and caps are worn while entering ICU. Only one third of doctors used caps while two third nurses did so. One fourth of staff endorsed use of ICU slippers while using bathroom. Nurses said that slippers were washed once a week.

Three-fourth doctors and two-third nurses endorsed that they wash hands every time they touch the patient. Major reason for not washing hands are depicted in Figure 1. Non availability of appropriate equipment and hand sanitizers was the major reason. During emergencies also, doctors attended patients without washing hands. Similarly, due to non-availability of gloves and excessive work load, staff sometimes didn't wear gloves.

Table 2: Basic Hygiene Practices and Notification of HAI

Basic Hygiene Practices	Doctors (n=16)	Nurses (n=28)
Use of Slippers & Caps		
Use of ICU slippers	12(75%)	24(87%)
Use of ICU slippers in bathroom	4 (25%)	6 (21%)
Use of caps in ICU	5(34%)	18(65%)
Hand Washing		
Wash hands/use hand sanitizer before & after examining patient	12(75%)	19(68%)
Situation when HAI will be notified	**Doctors**	**Nurses**
Death of patient	2(11%)	14 (49%)
Deteriorating condition of patient	2(11%)	3(10%)
Every HAI case	2(11%)	2(7%)
Large number of HAI cases occur	11(66%)	9(33%)

Notifying HAI: Two-third of doctors and one-third of nurses were of the opinion that HAI be notified only

when unusually large number of cases occur, while half the nurses would do so, on occurrence of death of patient. Less than 10% of staff thought it important to notify each case of HAI. (Table 2)

Availability and Use of Standard Operating Procedures (SOPs): While 32 to 82% subjects knew that certain SOPs are available in ICU, but less than half the staff (10 to 44%) had ever read them. (Table 3)

Table 3: Availability of SOPs and if Read by Staff

Standard Operating Procedure (SOP)	Positive response to knowing if SOPs available (n =44)	Read by staff (n=44)
Management of surgical site infections	19 (45%)	10 (23%)
Ventilator associated pneumonia	14 (32%)	4 (10%)
Sterilization procedures	33 (76%)	18 (43%)
Antimicrobial use policy	36 (82%)	19 (45%)
Isolation practices	29 (67%)	14 (32%)
Bio-Medical waste management	34 (78%)	10 (23%)

DISCUSSION

Major Modes of Transmission: Present study showed that 87% of doctors knew that HAI spreads through cross-transmission while 78% nurses stated that it spreads through environment. A study by Gogia and Das has documented doctors and nurses to be having this awareness at 88.46% and 83.64% respectively.[4] The source of infection could be either endogenous/self/auto-infection or cross contamination and cross infection. Since majority of doctors knew that HAI occurs from 'cross-contamination' indicates that they would be more amenable to modalities of preventing cross contamination. While nurses felt that most infections are 'endogenous' indicates gap in knowledge of nurses, which could hamper prevention and control of HAI in ICUs.

Most important preventive measures

Hand Hygiene: Hand hygiene was considered important by more doctors than nurses (93% and 82% respectively). Hand washing removes 90% of transient (superficial)

flora including most contaminants.[5] Gogia and Das found doctors as compared to nurses abiding by hand washing practices at 96.15% and 98.18% respectively.[4] As per another study, staff engagement, stress and hospital leadership are important organizational factors associated with health care personnels' knowledge, attitude and practice.[6]

In the present study, 75% doctors and 68% nurses endorsed hand-washing every time they touch the patient. Gogia and Das also bring out various reasons for not adhering to hand hygiene like, lack of facility, high patient to staff ratio, allergy, laziness and emergencies, which doctors attributed 38.5%, 0%, 7.7%, 7.7% and 46.2% respectively, whereas nurses 12.5%,37.5%, 12.5%, 12.5% and 25% respectively.[4]

Ideally, hands should be disinfected with alcohol when an infected tissue or body fluid is touched. Hands should be washed for 5-10 minutes with an antibacterial detergent containing chlorhexidine or an iodophore, or rubbed twice for 2 minutes with an alcoholic solution of one of these antiseptics.[5,7]

Non availability of hand sanitizers and emergencies were the major reason for not washing hands. Knowledge, attitude and practice of a simple 'tool' like hand washing leaves a lot to be desired. This is an area of concern, both for doctors and nurses. It is a shortcoming that promotes and hampers prevention HAI.

Urinary Catheters: Device associated HAIs are the biggest threat to ICU patients. High frequency of infection is associated with use of invasive devices, esp. central lines, urinary catheters and ventilators.[6] In 2002, CDC reported that major HAIs include catheter-associated Urinary tract infections(40%).[8] Catheter associated UTI is defined as the presence of a urinary catheter >48 hrs with fever or costo-vertebral angle/suprapubic tenderness and positive urine culture.[9]

In the present study, use of urinary catheter 'only when indicated' was considered an important preventive measure, almost equally by both nurses and doctors. Both doctors and nurses had fair knowledge about the catheter related precautions. 92% doctors and 86% nurses said that they remove catheter within 24-48 hours unless indicated. However, adherence to documentation of catheter insertion and removal dates was only 67% and 59% in doctors and nurses. According to Gogia and Das, single most important factor for preventing HAI is using urinary catheter only when indicated; (doctors 76.92%

and nurses 52.73%).[4] With evidence based strategies, Umscheid et al. described how catheter associated UTI are preventable.[10]

Linen & Clothings: In the present study, 55% nurses said that they do not shake used linen to prevent dissemination of microorganisms whereas 35% sometimes did that. 35% nurses ensured that soiled linen is put in bleach, washed, dried and then sent to laundry, 63% sent them directly and 12% had no idea. Gogia and Das reported that, as per 84.62% doctors, used linen was not shaken, while it was 81.82% as per nurses. The soiled linen is put in bleach, washed, dried and then sent for laundry as per 98.18% nurses.[4]

In the present study, 75% doctors and 87% nurses endorsed that ICU slippers and caps are worn while entering ICU. Use of caps was minimal for doctors, only 34% while 65% nurses wore caps. Study by Gogia and Das found wearing of caps in doctors and nurses at 76.92% and 47.27%.[4]

Knowledge about Bio-Medical Waste (BMW): In the present study, 60% doctors and 54% nurses were able to enlist various colour codings recommended for BMW segregation. Only 51% doctors and 45% nurses could elaborate, equipment used for BMW. Use of Sodium Hypochlorite in laboratories for disinfecting liquid waste was agreed upon by most. Gogia and Das' study suggests 72.92% doctors and 100% nurses believed in segregating BMW at source and 100% doctors and 98.18% nurses believed that proper colour coding could prevent HAI.[4]

63% doctors and 57% nurses said that they cover spills of blood or body fluids with sodium hypochlorite for 10 minutes and then mop dry State of awareness and practice with respect to BMW management seemed poor. This not only compromises HAI status of ICU, but it also threatens safety of health care workers and public. Its a void hampering prevention and control of HAI.

Notifying Occurrence of HAI: Doctors thought HAI be notified only when unusually large number cases occur. While most nurses felt the need of notifyinh HAI in case of a death. A uniform policy on notification of HAI must be communicated, so that early and adequate steps can be taken for prevention and control.

Limitations of Study: This is a relatively small study, respondents being from a single hospital. Even though entire staff has been taken-up for study, yet sample size remains small, limiting generalization. Notwithstanding the

limitations, study brings forth gaps between ideal conditions and the practice adopted in reality. This stimulates thought for management to take appropriate measures.

RECOMMENDATIONS

Hand hygiene: Hospital must develop and implement hand-hygiene program, ensuring written policies, education, techniques, and availability of hand-hygiene agents.

ICU Slippers/Caps: Proper use of ICU-slippers, clothing, gowns, etc should be insisted upon.

Linen hygiene: Adequate resources, must be devoted to cleaning and disinfection of linen and equipmen.

BMW: Administration must take all steps possible to offset lacunae in BMW management.

SOPs: Though SOPs were in practice, improvements could be made with regular reieteration and adherence to them. Monitoring, surveillance; and reporting HAI back to individual doctors would also help.

Training: Staff should be trained on infection control measures.

Vaccinations: Staff must be adequately vaccinated.

HAI Control Committee: Hospitals shall have multidisciplinary infection prevention and control committee whose responsibilities include annual goal-setting, program evaluation and ensuring that the infection control system meets current standards.

CONCLUSION

This study showed that doctors and nurses had a fair knowledge about various aspects of infection control in the ICU setting. However the lacunae in practice at the site and availability of requisite equipment, personal protective gear and lack of adequate training; 'will and attitude' to practice the right procedures seemed to be sore issues.

Importance of various preventive measures to reduce the incidence of HAI has been re-emphasised. Policy-makers must ensure alleviating the 'HAI-factors' elaborated in the study, be kept in mind while formulating protocols.

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Dietary Practices and Nutrient Content of Vegetarian & Non-vegetarian Diets of Young Adults

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ABSTRACT

Vegetarian diet has attracted attention for many reasons; good health, less disease, ethics, animal-rights, etc. Hardly any literature on is available from India. Diet of 401 young vegetarian and non-vegetarian males was assessed in this cross sectional study. Intake of protein, fat, iron, and niacin was significantly higher in non-vegetarians ($p<0.01$). Intake of Vitamin A, C and riboflavin ($p<0.01$) was higher for vegetarians. There was no significant difference in calcium, phosphorus, thiamine and folic acid intake. Availability of percent energy from carbohydrates is higher for vegetarians, but from fat, it is higher for non-vegetarians (24.7% vs 17.5%). For vegetarians, intake of energy, protein and fats was 10.4%, 51% and 213% in excess of RDA respectively. These differences were much exaggerated for non-vegetarians. Iron, niacin and cobalamin intake was lesser than RDA for vegetarians. Prevalence of pallor was higher in vegetarians and obesity in non-vegetarians.

Keywords: *vegetarian diet, non-vegetarian, nutrient*

INTRODUCTION

"Beef causes exacerbation of melancholic disorders and is difficult of digestion… …and goat's flesh is as bad."   *Hippocrates[1]*

In ancient India, a lacto-vegetarian diet was prescribed to develop the mind over the body and bring about intellectual achievements, gentleness and philosophical attitude.[2] But since man had an inherent curiosity and desire to devour meat he started relishing the non-vegetarian as well.

From antiquity, vegetarian diets have been followed for a variety of reasons. Early focus on vegetarian population was owing to potentially adverse effects of meat. Such interest was motivated not just by the comparison between vegetarians and non vegetarians, but also by international correlations indicating strong positive association between consumption of meat and incidence of many chronic diseases like cancers and cardiovascular disease.

Most vegetarian diets are characterized by high contents of vegetables, fruit, whole grain, legumes, nuts and fiber that provide health benefits. The removal of meat as a major source of energy does create an opportunity for larger consumption of these foods. Adequate intake of folic acid can also reduce risk of neural tube defect pregnancies. Role of β-carotene in prevention of lung cancer is being evaluated. Health benefits of higher fiber intake and is well known. Benefits of a vegetarian diet seem to be endless and still growing with new work on antioxidants, phytochemicals, etc.[3]

Why this Study: Though, reasonable literature can be found on issues related to vegetarianism and meat eating, spread over the past hundred years or so, there are hardly any studies on Indians. Epidemiologically, as asserted by Lilienfeld, it is important to 'test a hypothesis and see if results are replicated in as many different settings/ methods as possible' to establish association/causation

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of disease.[4] The ever-emerging association between vegetarian diet and health is overwhelming. Owing to these reasons it was decided to pursue a study on assessing the dietary practices amongst young male adults; and to evaluate the nutrient content of vegetarian or non-vegetarian diet consumed.

METHOD

The present study was a cross sectional analytical study undertaken in Andhra Pradesh. Young males comprised the study population. A total sample size of 400 was calculated (200 for vegetarians and 200 for non-vegetarians). An initial questionnaire based on predetermined definitions, was administered to ascertain subjects' dietary habits. Thus they were subdivided into vegetarians and non-vegetarians. The study was undertaken from May to September 2016. The nutritional intake of subjects was assessed through a standard diet survey schedule as per the ICMR format.[5] The individuals were then subjected to clinical examination to detect signs of nutritional deficiency.

Findings: The present study was conducted on a total of 401 males, out of which 201 were vegetarians and 200 were non-vegetarians.

Demographic Details: The age ranged from 18 to 25 years; mean age was 22.44 years (vegetarians 22.53 and non-vegetarians 22.34 years). The subjects hailed from practically every state of the country. It was observed that subjects from Delhi, Gujarat, Haryana, Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh were predominantly vegetarians. Subjects from Andhra Pradesh, Assam, Jharkhand, Himachal Pradesh, Kerala, Manipur, Maharashtra, Orissa, Tamilnadu and West Bengal were predominantly non-vegetarians. Majority were Hindus (96% of vegetarians and 91% of non-vegetarians) with few Muslims (3.4% vegetarians and 5% non vegetarians).

Dietary Habits: About 55% of subjects consumed non-vegetarian food once in two days and more than one third (41.8%) consumed it two times a week or less. More than three fourth of all the non-vegetarian subjects had started taking flesh food since their childhood. Milk was consumed almost by all since birth (>93%). Most of subjects (51%) who did not take non-vegetarian food was because they didn't like its taste. About one fifth each, did so for family traditions (21%) and religious beliefs (17%). About 9% avoided non-vegetarian food as they were against killing animals.

Food and Nutrient Intake: A diet survey was conducted on a subsample of 100 subjects, to ascertain daily food and nutrient intake and is summarized in tables 1 and 2.

Table 1: Daily Food Intake by Diet Groups

Food	Vegetarian Value/SD		Non-veg Value/SD		Significance (p)
Cereals	591.5	52.6	602.9	46.1	NS
Pulses	69.9	16.4	68.8	19.8	NS
Leafy veg	4.6	4.9	4.4	5.0	NS
Other veg	30.8	17.9	24.9	18.0	NS
Roots	67.7	13.6	64.4	19.2	NS
Condiments	3.3	0.2	3.6	0.7	NS
Fruits	50	3.3	0	0	<0.001
Flesh foods	0	0	137.8	141.6	<0.001
Milk/products	215.9	52.8	111.0	30.8	<0.01
Fats	40.7	3.4	60.2	23.4	<0.01
Sugar	37.2	12.8	33.3	9.3	NS
Other foods	42.6	38.4	6.2	1.6	<0.01

Table 2: Daily Nutrient Intake by Diet Groups

Nutrient	Vegetarian Value/SD		Non-veg Value/SD		Significance (p value)
Energy	3175.3	300.6	3392.2	511.4	NS
Protein	90.6	9.3	108.7	29.9	<0.01
Fat	62.6	6.0	93.3	42.9	<0.01
Calcium	688.7	126.9	642.9	251.7	NS
Phosphorus	2332.9	209.7	2338.2	284.5	NS
Vitamin A	366	57.0	196.2	47.7	<0.01
Thiamine	2.6	0.2	2.8	0.4	NS
Riboflavin	1.5	0.2	1.4	0.3	NS
Niacin	24.9	2.0	33.6	10.1	<0.01
Vitamin C	41.5	5.3	23.5	6.5	<0.01
Iron	25.6	1.9	29.1	4.7	<0.01
Folic acid	294.9	25.8	294.3	43.9	NS
Cobalamins	0.86	0.2	11.4	4.2	<0.01

Energy intake of non-vegetarians is higher than vegetarians, but the difference is not significant. Protein and fat intake is significantly higher for non-vegetarians (p<0.01). The intakes by vegetarians are significantly higher than non-vegetarians for Vitamin A and C (p<0.01). The intake of iron and niacin was significantly higher in non-vegetarians (p<0.01). However there was no significant difference in calcium and phosphorus intake. There was no significant difference in intake of thiamine and folic acid. Intake of riboflavin was higher amongst vegetarians.

The availability of percent energy from carbohydrates was higher for vegetarians, but from fat it was higher for non-vegetarians (24.7% vs 17.5%).

Table 3: Comparison of Nutrient Intake with RDA

Nutrient	Vegetarians			Non-vegetarians		
	Intake (Mean)	RDA;Value & difference	Percent Difference	Intake (Mean)	RDA ;Value & difference	Percent Difference
Energy	3175.3	2875	+ 300	+ 10.4	3392.2	2875	+517.2	+ 17.9
Protein	90.6	60	+ 30	+ 51	108.7	60	+ 48.7	+ 81.2
Fat	62.6	20	+ 42	+ 213	93.3	20	+ 73.3	+ 366
Calcium	688.7	400	+ 288	+ 72.1	642.9	400	+ 242	+60.7
Phosphorus	2332.9	1000	+1332	+ 133	2338.2	1000	+ 1338	+ 338
Vitamin A	366	600	- 234	- 39	196.2	600	- 403.8	- 67.3
Thiamine	2.6	1.4	+ 1.2	+ 85.7	2.8	1.4	+ 1.4	+ 200
Riboflavin	1.5	1.6	- 0.1	- 6.25	1.4	1.6	- 0.2	- 12.5
Niacin	24.9	18	- 6.9	-38.3	33.6	18	+ 15.6	+ 86.6
Vitamin C	41.5	40	+ 1.5	+ 3.75	23.5	40	- 16.5	+ 41.25
Iron	25.6	28	- 2.4	- 8.5	29.1	28	+ 1.1	+ 3.9
Folic acid	294.9	100	+ 194	+194.9	294.3	100	+ 194	+ 194.3
B12	0.86	1	- 0.14	- 14	11.4	1	+ 10.4	+ 1040

For vegetarians the intake of energy, protein and fats is 10.4%, 51% and 213% in excess of RDA respectively. These differences are much exaggerated for non-vegetarians to 17.9%, 81.2% and 366% (in excess of RDA) respectively. The intake of calcium and phosphorus are also between 60% and upto 3.3 times higher than RDA. Vitamin A intake is lower than RDA for both groups, more so for non-vegetarians (67.3%

against 39% in vegetarians). Intake of thiamine, folic acid and vitamin C are higher than the RDA for all. Intake of niacin and cobalamin is less than RDA by 38.3% and 14% respectively for vegetarians. It is on the higher side for non-vegetarians by 86% and 10 times than RDA. Iron intake too is 8.5% lesser than RDA for vegetarians whereas for the non-vegetarians it is marginally higher.

Nutrition Related Clinical Signs: In present study, only pallor, angular stomatitis, obesity and dental caries were observed. Pallor, was seen in significantly higher number in vegetarian (7.8%) as compared to non-vegetarians (2%) (p<0.01). Incidence of obesity was seen in 6% non-vegetarians as compared to 1% in vegetarians (p<0.05). No significant difference is seen in the occurrence of angular stomatitis and dental caries.

DISCUSSION

Dietary Habits: Most of the non-vegetarian subjects had started taking flesh food early in childhood probably implying that practice of non-vegetarianism is set early.

Reasons for not eating non-vegetarian food: The comparison of our data with the Western data on this issue may not always be valid. The values associated with family traditions, religious beliefs and animal rights differ from society to society. Most of the subjects who do not take non-vegetarian food (51%) are vegetarians because they don't like its taste. Other reason is owing to the family tradition of non-vegetarianism or religious belief (17%) or being against killing animals (9%). On the other hand, various studies in the West cite health, animal welfare and environmental reasons for vegetarianism.

Food Intake: In the present study, non-vegetarians consumed significantly higher quantity of fats (p<0.01), condiments (p<0.01) and roots (p<0.01). Higher quantity of fat and condiments go along, in preparation of flesh foods explaining their significantly higher consumption. Vegetarians consume significantly higher amount of milk, fruits and sugar (p<0.01). Vegetarians also consume a higher amount of pulses and green leafy vegetables than non-vegetarians (though not statistically significant). Many factors contribute to this difference: attitude, a higher consumption of fruits and milk as a compensation for not eating non-vegetarian food, higher awareness for balanced diet and traditionally higher consumption of fruits and milk in vegetarians.

There is no significant difference in intake of cereals, probably as cereal is consumed as chapatti or rice, which is staple for both groups, consumed in equal quantity.

Hardinge and Crooks in a US study find lacto-ovo-vegetarians consume more milk, total cereals, potatoes, legumes, fruit and nut but less of white cereals, eggs, sweets, fats, protein and calories than non-vegetarians.[6] Similarly, Haddad found that vegans consumed more grains and bread, vegetables, fruits, nuts, soy and legumes. Trend of the present study appears to be similar to studies conducted elsewhere.[7]

Nutrient intake

Proteins: Non-vegetarians' intake of proteins was significantly higher than vegetarians, (p<0.01). Even though vegetarians consume higher quantity of non-flesh protein, about 30% in excess of RDA, even then in the final analysis, the non-vegetarians' protein intake is found higher. This is because of flesh foods consumed by non-vegetarians. The same results are seen in other studies framed in diverse settings.[8]

Carbohydrates: In the present study, there was no significant difference in total intake of carbohydrates, but the percent energy derived from carbohydrates is higher for vegetarians; (79.3% vs 75%). Tayter and Stanek found on an American sample of boys, that carbohydrates contributed to 63% and 50% to total calories amongst vegetarians and non-vegetarians respectively.[8]

Fats: The non-vegetarians' intake of fats is significantly higher than vegetarians (p<0.01). A higher consumption of fat in food is not only the major contributor to higher nutrient fat content but also to the higher energy intake for non-vegetarians.[9] Ellis and Mumford report in a UK study that intake of total calories, fat and percentage of calories from fat were all less in vegetarians than omnivores.[10]

Calcium and phosphorus: Both vegetarians and non-vegetarians' intake of calcium and phosphorus was much higher than the RDA. Vegetarians' consumption is higher than non-vegetarians', probably due to higher intake of milk by vegetarians. Ellis and Mumford also found intakes of calcium, greater in vegetarians.[9]

Vitamin A and C: The intake of vitamin A is lesser than RDA, a matter of concern. But intake of both vitamin A and C is higher for vegetarians (p<0.01). This is owing

to a higher consumption of vegetables and fruits by vegetarians.

Vitamin B$_{12}$: In the present study it is found that intake of vitamin B$_{12}$ is less than the RDA for vegetarian, which is little less than RDA (14% less). **Janelle** found in Canadian women that the vegetarians' mean intake was 70% lower than RDA for vitamin B$_{12}$.[11] Milk appears to be the crucial foodstuff, which prevents deficiency of vitamin B$_{12}$ in vegetarians. It is therefore not alarming for if sufficient milk is ensured.

Other water-soluble vitamins: There is no significant difference in the intake of thiamin and folic acid. Intake of both these vitamins is up-to twice that of the RDA in all groups. Haddad found that vegans' diet provided significantly higher amounts of folic acid, than non-vegetarians' diet.[7] Ellis and Mumford and Nieman, et al in two separate studies found a higher intake of thiamine in vegetarians.[10,12]

Iron: In the present study low intake of iron points at a definite deficiency of iron intake. Another aspect is that the intake is significantly higher in non-vegetarians (p<0.01). With consumption of other iron sources being almost at par, meat intake by non-vegetarians has made their diet relatively richer in iron. However in most other studies iron intake in the vegetarians is found to be greater than omnivores.

Nutrition Related Clinical Signs: No significant difference is seen in the occurrence of nutrition related clinical signs between vegetarians and non-vegetarians except for pallor and obesity. Pallor was significantly higher for vegetarian. Some other studies too show similar findings of higher rate of anaemia in vegetarians. The lack of iron, initiated by lesser intake, is further worsened by 'vegetarian' inhibitors of iron absorption (phytates, phosphates, fiber). Moreover all the iron in a vegetarian diet is non-haeme iron, utilization of which is poorer than haeme iron of non-vegetarian source, leading to anaemia.

Incidence of obesity is significantly higher in non-vegetarians. This could be because of the higher intake of fats through the non-vegetarian diet.

There is no other difference in the incidence of clinical signs between vegetarians and non-vegetarians, confirms that vegetarian diet *per se* is good enough to meet daily nutritional requirements. Hardinge too has

concluded that a vegetarian diet meets the nutritional requirement of all age groups, and that even vegan diets comprising of unrefined cereal products, legumes and fruit produce no detectable deficiency signs.[6]

CONCLUSION

It is clear that vegetarian diet is a healthy option. Suitable modifications made to this diet can certainly overcome minor shortcomings. The few disadvantages like deficiency of iron can be rectified with little dietary modifications and health education.

1. Young adults be educated about the importance of a balanced diet.

2. Milk should be an essential component of any vegetarian diet. This would not only provide enough high quality proteins but also offset any systematic deficiency of Vitamin B$_{12}$.

3. Enough green leafy vegetables be included, contributeng to iron intake.

4. A piece of jaggery added to diet would also help improve iron status.

5. Fresh fruits must also form an essential part.

6. Saturated fats (ghee, butter, etc) should be replaced by unsaturated plant fats e.g. refined oils.

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Usage of E-Payment and Customer Satisfaction

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ABSTRACT

Digital revolution has altered the routine life style of people. The power of world wide web and digital payments is having pivotal role in getting connected and making any time any where payments at your fingertips. Even though there are enormous advantages, a technology can be successful only if it is able to attain user satisfaction and there by leads to consumer loyalty. This paper is focussed to analyse the determinants influencing E-payment usage and thereby the factors leading to consumer satisfaction. The factors so revealed includes perceived use, perceived ease of use and actual usage of the system. The findings based on various literature reviews recommends that trust, consumer interaction, service delivery, ensuring security from hackers are the determinants which needs to be considered.

Keywords: *Determinants, Digital payments, Security.*

INTRODUCTION

Digital revolution has paved the path for E-payment system. This revolution has emerged with e-banking, e-registration, e-shopping, e-payment, e-learning, e-library, etc. This paper focuses on usage of e-payment among youngster's and its customer satisfaction. E-payment system is a payment system in which monetary value is digitally transmitted between two entities. An entity can be a bank, business, government or a consumer (Tan[21]). In general context enabling net-based technological innovations and e-communication networks can be termed as e-payment (Alireza Chavosh[5], Anahita Bagherzad Halim , and et.al,). In order to satisfy our needs with an ease of time, comfort and convenience the users have to be tech savvy. Today the situation is transformed from one factor authorisation to two factor authorisations in order to ensure safety and security. The RBI[19] report have stated their vision statement as to build best payment and settlement system for a digital India through approachable directives, healthy infrastructure, efficient control and consumer attentiveness.

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OBJECTIVES

1. To review literature on various channels used for e-payment.

2. To Study various dimensions of customer satisfaction on e-payment.

Channels Used for e-payment: The RBI[19] classifies the channels of cashless fund transfer or transaction using cards or mobile phones as 'prepaid payment instrument'. The e-payment system comprises of digital wallets, credit card transaction, Net banking, Mobile payment system, and debit card.

Two Storage methods are used for E-payment system

On-line: Here the user does not have possession of virtual cash. He has to do the transaction through the third party which is the user's bank.

Off-line: User are in possession of smartcard or digital wallet which has e-cash in it.

Digital wallets (e-wallets): This is a virtual wallet used to store the details of credit card numbers, e-cash, the identity of the owner and other relevant information such as address, or any other details which are required at the time of check in on e-commerce sites. The Electronic wallets or digital wallets saves the time from repetitive entry of information each time. E-cash can be stored in

these wallets the source of cash can be from credit cards, or through your bank account. The various E-wallet companies in India are paytm, Mobikwik, Oxigen wallet, Citrus Wallet, Jio Money, ItzCash, Freecharge, Axis Bank Lime and so on.junadi[16].

Credit card transactions: The most common form of payment system is the credit card and debit card payments. Credit card acts as if you are obtaining loan from a bank , the amount you are spending is from the bank. The balance in it have to be settled each within a particular time limit and in case of default interest will be added along with the amount you spend. But anyhow credit cards are not suitable for micro payments (payments smaller than $ 1) Nuthan[18].

Electronic cheque: Electronic Cheque performs the similar function of a physical cheque but here the e-cheque is virtual, when compared to physical cheque the e-cheque has more security features it includes verification, public key cryptography, digital signatures and encryption Nuthan[18].

Smart Card: Smart card is aslo known as Integrated Circuit Card (ICC) and it is embedded with a microprocessor chip. It was introduced in Europe. This chip can store all relevant information like both personal and financial. This card can be used like credit and debit card and used as even personal identity card for Organizations. This card makes travelling easy. While Travelling abroad it is difficult to take cash, instead by using smart card you can swipe and get the local country currency which is applicable in the particular country. The cash is stored in an encrypted form and it is secured with a password. Smart National Common Mobility Card, helps to buy tickets and make transportation easy.[6]

Debit card: Debit card can also be used as an ATM card which is a prepaid card. A User opens a bank account where he receives his user id number he can swipe it and use to pay bills and even for online purchases this can be used. Debit card is applicable for all the users having bank account. When the card is swiped through the POS machine it contacts the banking system and checks the pin and confirms whether the transaction should be proceeded or not as the user cannot transact the amount which is more than the amount which he is having in his account.

Net Banking: Timothy [22] Net banking refers to the banking enabled through online hence it is also known as online banking, e-banking, virtual banking. Using net banking one can transfer funds among different accounts, third party or to a credit card. The payment and settlement of bill can also be done using Net Banking. Net Banking can be done through NEFT, RTGS, or IMPS immediate payment service. All the banks have their own websites so that the users can log in and collect the information related to account opening, reports, statements and so on.

Mobile banking: Peter Stalfors, Rasmus Nykvist[20] Mobile banking can be done using a smartphone. The user can acess the bank's website and view his account balances, can do any monetary transactions, can settle bills, air time top-up, and so on. Mobile banking is performed through SMS or Internet. Mobile banking can also be used in E-commerce transactions to settle the vendors. M-banking is also known as personal digital assistance.

Various dimensons of E-payments

Perceived Ease of use: Flavian and Guinaliu[10] observed that trust level influences the perceived ease of use of a computer system. As the user gets acquainted to the technology the chances of error accumulation diminish which is an important factor in delegating financial services online. Like wise security and privacy policy are also the rudimentary essentials of digital payment system.

Ainscough and Luckett[12], concluded that customer interaction plays a pivotal role in delivering e-payment users virtuous delivery.

Abrazhevich[2] stated that Design is yet another determinant in deciding the feat of e-payment service among consumers. In brief content, design, channel image and speed are the significant determinants which lead to perceived ease of use.

Consult[6] concluded that the skill of the users are significant in terms of perceived ease of use inorder to trial novel inventions and assess its advantages easily. He stated that perceived ease of use is a combination of expediency along with internet connectivity, availability of tenable, e-payment functionality and it also persuaded the reachability of banking services. Thus, perceived ease of use acts a significant role in user satisfaction.

Perceived Use: Davis[8] stated perceived usefulness as a trust that usage of a specific technology would boost job performance. It also has a major effect on intention

to use. Through the application of TAM perceived usefulness acts as one of the key to measure attitude influence to the innovative technology.

Hsin Hsin Chang[13] found that there is direct influence of perceived usefulness and perceived ease of use in his study. He then analysed the influence of both of these factors towards behavioural intention and concluded that perceived usefulness have dominance over intention to use.

Actual Use: Davis[8] found that the user's attitude towards a technology and its applications is a vital element to determine if the user makes use of the system or not.

Abrazhevich[2] confirmed in his study that the consumer's insight of e-payment has a pivotal effect on its actual usage and it is clear that it is depending on the consumer's attitude.

Eastin[9] observed that feasibility of technology in terms of security, confidence and efficiency will reflect on User's intention to use e-payment. The study also states that erstwhile adoption of Information technology had a significant influence on consumer's usage of e-payment as they have already experienced it before.

AFP Electronic payments survey[3] conducted in Bethesda US concluded that the finance professionals view the digital payments positively and most of the organizations use these mobile payments to send or receive payments, where as the finance professionals raised the issue that payment standards need to be maintained.

Consumer satisfaction: Hoffman and Novak[12] proposed that download speed is one among the determinant of user satisfaction.

Timothy[22] proposed that the potential of a user-oriented organization can be raised only through the user satisfaction. Hence the user's needs should be identified and act accordingly to fulfill them thus the customers can be retained.

A.Jafari, F. Bagheri, and N. Hosseinzadeh[1] suggested that the strategies to retain the customer's and their sustainablilty , ensuring novel services, has paved the way for the organizations to come out with the strategies not only to retain the existing consumers but also to enthral novel consumers.

Nikghadam Hojati et al.[11] observed that there is a significant relationship between using e-banking services and customer satisfaction.

David Wright[7] analysed credit card payment system, e-check system, digital cash system and found that cryptography was employed to provide security for the consumer's informations but still consumers are reluctant to use the systems as they are scared of the hackers.

Conceptual Framework
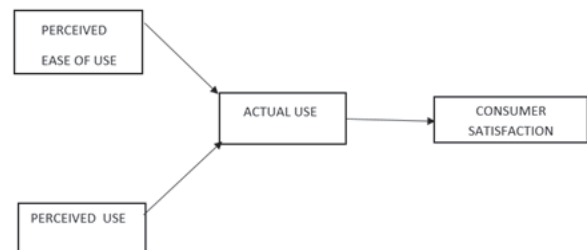
DISCUSSION

The findings of this study suggest that technology innovationcan be successful only through User's satisfaction so along with retaining the existing consumer's, measures have to be taken to attract new consumer's to use digital payments.

This paper presented a conceptual model of Determinant's of User satisfaction for Digital payment system. The model formulated Perceived Ease of Use (PEOU), Perceived Usefulness (PU) as the determinants for the acceptance of Digital payment system. The actual use of e-payment systems are influenced by attitude of the consumer's, feasibility of the technology, consumer perception towards using the technology and so on. Consumer satisfaction can be gained only through better service, download speed of the websites without any interruptions, strategies should be developed to gain new customers and to retain the existing consumer's.

CONCLUSION

Variables that influence consumer's commitment towards e-payment systems include quality, trust, perceived ease of use, perceived usefulness and satisfaction. The research findings indicate potential customers' satisfaction levels of e-payment usage whether they are ready for the adoption of changed lifestyle and,

if not, what encourages and discourages them from usage of e-payments. Therefore, necessary strategies to implement are proposed, along with approaches they can be used to enhance e-payment environment.

Ethical clearance: Not Applicable

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Relationship among Pain, Functional Disability, Kinesiophobia and Health-Related Quality of Life in Quarry Workers with Work-Related Low Back Pain

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ABSTRACT

This study investigated the relationship among pain, functional disability, kinesiophobia and health-related quality of life (HRQoL) in patients with work-related low back pain (WRLBP).

Eighty-six individuals with WRLBP participated in the study. Pain intensity, functional disability, kinesiophobia and HRQoL were assessed using Quadruple Visual Analogue Scale, Oswestry Low Back Pain Disability Questionnaire, Tampa Scale of Kinesiophobia and WHO- QoL BREF respectively. Data were analyzed using descriptive statistics, Pearson's correlation test and stepwise regression analysis with alpha level set at 0.05.

The mean age of the participants was 34.6 ± 6.88 years. There were significant positive correlations between pain intensity and each of functional disability and kinesiophobia (r =0.605, 0.589,p <0.001) and negative correlation with HRQoL (-0.371.p =0.001). Functional disability showed a significant inverse relationship with HRQoL and a significant strong positive correlation with kinesiophobia scores respectively (-0.487, 0.754, p < 0.001) while HRQoL showed a significant inverse relationship with each of pain intensity (-0.371, p = 0.001) functional disability (-0.487, p < 0.001) and kinesiophobia scores (-0.505, p < 0.001). Stepwise regression analyses indicated that pain intensity is the most significant predictor of functional disability (R^2 = 0.308) , kinesiophobia (R^2= 0.339) and HRQoL (R^2 = 0.158).

Pain intensity was the most significant predictors of physical function, kinesiophobia and HRQoL in patients with WRLBP.

Keywords: *Pain, Functional disability, Kinesiophobia, Health-related quality of life, Work-related Low back pain.*

INTRODUCTION

Work-related low back pain (WRLBP) is any back pain originating in the context of work and considered clinically to have been probably caused, at least in part, or exacerbated by the claimant's job[1]. Occupations involving heavy physical work are found to be a significant statistical risk factor in the development of lower back pain[2].

WRLBP remain the leading cause of disability in persons younger than 45 years old[3]. More than one-quarter of the working population is affected by LBP each year[4] with a lifetime prevalence of 60–80%[5] and account for a large percentage of LBP claims for long durations -more than 90 workdays lost[6].

WRLBP among industrial workers leads to many consequences, which affect both employees and employers[7,8]. These consequences include restriction of the capability for work, limitation for social activities, fear of movement, emotional problems and reduced quality of life[9,10]. The resultant effects of these consequences are the loss of productive life years, high medical claims, sick leave, and unemployment[11,12,13].

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Literatures has shown that chronic LBP patients have more fear of movement, of physical activities and of exercising, and are more sensitive to pain and fearful of recurrence with negatively implication on their QoL[14,15]. Over the past decade, the specific role of fear in the onset, development, and maintenance of pain has received increasing attention[16]. Investigators have suggested that fear of pain and activity, driven by the anticipation of pain and increased injury—rather than the noxious sensory stimuli associated with pain itself—produces strong negative reinforcement for the persistence of avoidance behaviour, resulting in putative functional disability in people with persistent pain[17].

It has therefore been emphasize that fear of movement should be early identified and treated in patients with chronic low back pain because they are predictors for poorer evolution of QoL[14,15] similarly a multidisciplinary approach has been advocated by different treatment centers worldwide as an effective approach to the management of chronic low back pain, substantially improving the QoL of people with such clinical presentation[18,19].

Studies have investigated relationship/associations among pain, kinesiophobia and HRQoL in individuals with LBP[20,21,22,23] however there seems to be paucity of study on the relationships among pain, functional disability, kinesiophobia and HRQoL in individuals with WRLBP

This study was hence designed to investigate the relationship among pain, functional disability, kinesiophobia and HRQoL in individuals with WRLBP

MATERIAL & METHOD

This study was a descriptive cross-sectional survey evaluating the associations among pain, functional disability, kinesiophobia and HRQoL in patients with WRLBP. The study was approved by the Health Research Ethics Committee of the University of Ibadan and University College Hospital (Ref no: UI/EC/15/0142),. The participants were consenting quarry workers with primary complain of LBP of not less than 3 month duration who were screened for work-related low back pain using a standard Nordic musculoskeletal questionnaire[24] and through history of pain and physical examination. Quarry workers with WRLBP who had history of recent spinal surgery and elevated blood pressure (>140/90mmHg) were excluded from the study. Participants were selected through a purposive sampling technique having met the inclusion criteria.

MEASUREMENTS

Participants' age and sex were documented, height, weight and body mass index were assessed using standardized procedures.

Measures of Pain, Functional disability, Kinesiophobia and Health-related Quality of Life: Participants' pain intensity was assessed using the Quadruple Visual Analogue Scale (QVAS). The instrument assessed pain at the time of assessment (present pain), typical or average pain, worst pain and best pain. Oswestry Low Back Pain Disability Questionnaire was used for assessment of functional disability. Participants' index score was calculated by dividing the summed score by the total possible score, which was then multiplied by 100 and expressed as a percentage. Kinesiophobia (fear of movement) was assessed using Tampa Scale of Kinesiophobia (TSK). The TSK uses a 4-point Likert scale, with scoring options ranging from 1 = 'strongly disagree' to 4 = 'strongly agree'. A high value on the TSK indicates a high degree of kinesiophobia(e g. a score of 40) [23]. A score of 37 differentiates between high and low scores[17]. To assess the HRQoL of participants, the World Health Organisation Quality of life –bref (WHOQoL-BREF) which comprises 26 items that measure the following four domains: physical health, psychological health, social relationships, and environment was used. Domain scores are scaled in a positive direction (i.e. higher scores denote higher quality of life)[25].

DATA ANALYSES

Descriptive statistics of mean and standard deviation were used to summarize data. Inferential statistics involving Pearson's product moment correlation and stepwise regression analysis were also used. Alpha level was set at 0.05. The data analyses were carried out using SPSS 20.0 version software (SPSS Inc., Chicago, Illinois, USA).

FINDINGS

86 male quarry workers with WRLBP participated in this study. The ages of the participants ranged between 22 and 50 years (mean age of 34.6 ± 6.88 years). The

physical characteristics, pain intensity, functional disability, kinesiophobia and health-related quality of life scores of all the participants are presented in table 1. The correlation matrix of the relationship between pain intensity, functional disability, kinesiophobia and health-related quality of life in patients with WRLBP is presented in table 2. Participants' pain intensity demonstrated a significant positive correlation with each of functional disability and kinesiology scores (r =0.605, 0.589,p <0.001) but showed a significant negative correlation with HRQoL (-0.371.p <0.001). The participants functional disability showed a significant inverse relationship with HRQoL and a significant strong positive correlation with kinesiophobia scores respectively (-0.487, 0.754, p < 0.001) while participants HRQoL score showed a significant inverse relationship

with each of pain intensity (-0.371, p < 0.001) functional disability (-0.487, p < 0.001) and kinesiophobia scores (-0.505, p < 0.001).

Stepwise regression analyses were carried out to determine the influence of age and anthropometric (i.e height, weight and BMI) variables and pain intensity on functional disability, kinesiophobia and health-related quality of life respectively. Summary of regression analysis of functional disability, kinesiophobia and HRQoL as an outcomes and age, anthropometric variables and pain intensity as predictor is presented in table 3. The result indicated that pain intensity is the most significant predictor of both functional disability, kinesiophobia and HRQoL scores (p <0.05)

Table 1: Participants' characteristics and their LBP profile

Variable	Mean±SD	Minimum	Maximum
Age (Years)	34.6 ± 6.88	22	50
Height (M)	1.71 ± 0.07	1.52	1.88
Weight (Kg)	68.20 ±10.35	50	100
BMI (kg/m²)	23.16 ± 2.96	17.10	32.05
QVAS scores			
Present Pain	4.93 ± 0.83	4	7
Best Pain	2.50 ± 0.66	1	4
Average Pain	4.81 ± 0.86	2	7
Worst Pain	6.67 ± 0.67	5	8
Total Average Pain	54.80 ± 6.65	40	76.67
Functional Disability	25.18 ± 4.83	10	36
Kinesiophobia	31.32 ± 0.58	20	44
HRQuality of Life	71.65 ± 6.22	50.25	83.48

Table 2: Correlation among participants' variables

	PP	FD	KIN	HRQoL
PP	1	0.605** <0.001	0.589** <0.001	-0.371** <0.001
FD	0.605** <0.001	1	0.754** <0.001	-0.487** <0.001
KIN	0.589** <0.001	0.754** <0.001	1	-0.505** <0.001
HRQoL	-0.371** <0.001	-0.487** <0.001	-0.505** <0.001	1

Key : **Correlation is significant at 0.01 level (2 tailed)

PP= Present pain, FD= Functional disability, KIN=Kinesiophobia

HRQoL= Health-related quality of life

Table 3: Standard multiple regression analysis for functional disability, kinesiophobia and health-related quality of life

Dependent variables	Predictors	B	Std Error	Beta	P-value
FD	Pain Intensity	0.448	0.064	0.616	<0.001
	Age	0.037	0.062	0.053	0.548
	HT	69.20	48.961	1.005	0.161
	WT	-0.088	0.586	-1.886	0.137
	BMI	2.533	1.725	1.551	0.140
KIN	Pain Intensity	0.491	0.073	0.599	<0.001
	Age	0.031	0.070	0.040	0.657
	HT	90.635	55.627	1.166	0.107
	WT	-1.180	0.666	-2.235	0.080
	BMI	3.482	1.960	1.889	0.418
HRQoL	Pain Intensity	-0.349	0.95	-0.373	<0.001
	Age	-0.138	0.93	-0.152	0.141
	HT	46.50	73.27	0.524	0.527
	WT	-1.507	0.878	-0.757	0.605
	BMI	2.044	2.582	0.716	0.561

B: Unstandardized Coefficients; Beta: Standardized Coefficients

$P < 0.05$

For functional disability, R = 0.624, R^2 = 0.390

For kinesiophobia, R=0.618, R^2= 0.382

For HRQoL, R = 0.420, R^2 = 0.176

DISCUSSION

This study assessed the relationship among pain intensity, functional disability, kinesiophobia and health-related quality of life in patients with work-related low back pain.

The findings of this study showed that pain intensity showed a significant positive correlation with functional disability, an individual with minimal pain is likely to cope better with activities of daily living than one with increased pain who may likely exhibit activity limitation and participation restriction. This shows that pain is a possible predictor of functional disability in individuals with WRLBP and likewise functional disability is a predictor of pain. This finding therefore agree with previous report in literature that reported a positive association between pain intensity and functional disability in patients with LBP[26,27,28]. It is adduced that pain becomes more closely related with disability during the course of LBP[29]. It therefore implied that pain becomes more disabling with chronicity.

A positive relationship was observed between pain intensity and kinesiophobia in this study, this implied that the higher the pain intensity the higher the likelihood of the patient exhibiting fear of movement/activity. This result therefore agree with the findings of Arun et al,[30] and Larsson et al,[23] that found a positive correlation between pain and kinesiophobia. Kinesiophobia is said to have a negative influence on the outcome of rehabilitation[31,32] hence kinesiophobia should to be taken into account in the clinical situation.

The result of the present study showed a negative correlation between pain intensity and HRQoL. This implied that patients with higher pain intensity will likely exhibit low quality of life. Increased pain severity has been shown to be associated with lower levels of HRQoL[33] and high levels of functional disability[34] in patients with LBP.

The result of regression analysis in this study revealed pain intensity as the only significant predictors of functional disability, kinesiophobia and HRQoL in patients with WRLBP while age, height, weight and BMI were not significant predictors.

CONCLUSION

The results showed that patients with high pain intensity may have high functional disability,

kinesiophobia and low quality of life. Our results therefore support existing evidence that pain is significantly associated with functional disability, kinesiophobia and HRQoL among Nigerians with low back pain. It is recommended that management focus on WRLBP should address kinesiophobia and HRQoL beside pain and functional disability.

Conflict of Interest: None declared by the authors.

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Ethical Clearance: Study was carried out on human subjects in accordance with the ethical standards with permission and consent from Health Research Ethics Committee of the University of Ibadan and University College Hospital (Ref no: UI/EC/15/0142).

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Feto Maternal Outcome in Pregnancy with Anaemia in a Tertiary Hospital

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ABSTRACT

Purpose: To study the fetomaternal outcome in women with severe and very severe anaemia in labour.

Material and Methods: Prospective observational comparative study of 200 anemic pregnant women with 200 non anaemic pregnant women. All pregnant women with Hb value of ≤ 7g% were included in the study

Results: Out of 200 anaemic cases, 17 were very severely anaemic (<4g %) and 183 were severely anaemic (4-7g %). Low socioeconomic status (86%), inadequate antenatal care (70%), multiparty (62%), birth spacing <2 years (59.7%) were found to be risk factors for anaemia in pregnancy. It is found that there was higher incidence of Preterm deliveries (36%), PPH (14.5%), CCF (7%), morbidity (26.5%) than in non anaemic controls. Fetal adverse outcome in the form of preterm birth (36%), low birth weight (39%), IUGR (24.1%),NICU(16.5%),morbidity(16.5%) , mortality(2.5%) than non anaemic controls.

Conclusion: Increased severity of anaemia increases the adverse effects on the mother and fetus. So it is important to diagnose and treat anaemia in pregnancy to ensure optimal health of mother and newborn.

Keywords: *Pregnancy; Anaemia; Maternal outcome; Fetal outcome*

INTRODUCTION

In India anaemia is a major health problem diagnosed in pregnancy. Its prevalence is about 60% and may increase to 80% during pregnancy.[1]It directly or indirectly contributes to a significant proportion (about 40%) of maternal deaths.[1]It antedates the conception, often aggravated by pregnancy and delivery mainly due to iron deficiency and occasionally by other complex mechanisms.[2]

In pregnant women with severe and very severe anaemia, there is increased incidence of antepartum hemorrhage, preterm labour, sepsis, increased susceptibility to infection and asymptomatic bacteriuria.

During labour, there is increased incidence of uterine inertia, maternal exhaustion, PPH and maternal mortality. During puerperium,there is increased incidence of puerperal sepsis, thromboembolic events, delayed wound healing, wound gaping, failure of lactation.[3]

Fetal adverse effects are prematurity, LBW, IUGR, low APGAR score at birth, still births, poor perinatal outcome and perinatal mortality.[3] As anaemia is one of the leading causes of maternal and perinatal morbidity and mortality, one of the primary aims of antenatal care is to prevent anaemia during pregnancy to ensure safety during labour, puerperium and future health.

In developing countries like India due to low socioeconomic status, multiparty, improper antenatal care, less inter pregnancy interval lead to anaemia.This study helps to evaluate maternal and fetal outcome in women with severe and very severe anaemia in labour.

METHODOLOGY

Source of data: Prospective observational comparative study of pregnant women in labour attending the hospitals attached to J.J.M. Medical College, Davangere, between November 2014 to September 2016.

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Inclusion criteria: All pregnant women in labour of any parity with haemoglobin <7g% were included in the study. Pregnant women were divided into 2 groups.

Group 1: 200 pregnant women in labour with severe and very severe anaemia.

Group 2: 200 pregnant women in labour with normal haemoglobin level.

They are further categorized into severe anaemia with Hb between 4-7g% and very severe anaemia <4g%. The controls are selected among all pregnant women with Hb >11g% randomly.

Exclusion criteria: Pregnant women with mild to moderate anaemia. (haemoglobin – 7 – 11 g%), if associated Aplastic anaemia, Haemolytic Anaemias / Haemoglobinopathies, Respiratory diseases, Established IUGR, Intra uterine death, Cardiac disease, Hypertensive disorders of pregnancy were excluded from the study. The course of study is explained informed consent taken. All patients underwent nvestigations like complete hemogram, serum proteins, Blood grouping and typing,routine urine examination, HIV test, HbSAg and Obstetric ultrasound at term.

The severity of anaemia is assessed. The maternal and fetal outcome is studied. Patients details studied are age, parity, SES, birth spacing,booking status, associated medical disorder and previous delivery history. The gesational age and mode of delivery, operative interference,intrapartum complications like CCF, retained placenta, PPH, puerperal pyrexia, puerperal sepsis, subinvolution, lactational failure, episiotomy and LSCS wound gaping is studied.Fetal outcome is also studied as number of live births, still births, IUGR, NICU admission, birth weight.

The maternal and fetal morbidity and mortality is assessed.

Statistical Analysis: Data was analyzed using paired T test and chi-square test.

RESULTS

Pregnant women were divided into 2 groups.

Group 1: 200 pregnant women in labour with severe and very severe anaemia.

Group 2: 200 pregnant women in labour with normal haemoglobin level.

Among 200 case subjects, 183 (91.5%) were severely anaemic and 17 (8.5%) were very severely anaemic .Majority i.e., 64.7% (11 out of 17) of very severely anaemic cases and 72.7% (133 out of 183) of severely anaemic cases belonged to 20-29 years age group.

Table 1: Clinical features in cases and controls according to severity of anaemia

Sl. No	Clinical features	Cases N (%)	Very severe anaemia N (%)	Severe anaemia N (%)	Controls N (%)
	Weakness/fatigue				
1	Present	136 (68)	17 (100)	119 (65)	4 (2)
	Absent	64 (32)	0	64 (35)	196 (98)
	Total	200 (100)	17 (100)	183 (100)	200 (100)
	Dyspnoea/palpitations				
2	Present	33 (16.5)	17 (100)	16 (8.7)	0
	Absent	167 (83.5)	0	167 (91.3)	200 (100)
	Total	200 (100)	17 (100)	183 (100)	
	Pedal edema				
3	Present	66 (33)	17 (100)	49 (26.8)	6 (3)
	Absent	134 (67)	134 (73.2)	134 (73.2)	194 (97)
	Total	200 (100)	17 (100)	183 (100)	200 (100)

In our study, the most common symptoms of anaemia weakness/easy fatigability, palpitations/dyspnoea, pedal edema were seen in all the cases (100%) of very severe anaemia. 33% (66 out of 200) of cases had weakness/fatigue, dyspnoea/palpitations and pedal edema.(Table1) 47.1% (8 out of 17) of very severely anaemic cases and 67.7% (124 out of 183) of severely anaemic cases had vaginal delivery. 52.9% (9 out of 17) of very severely anaemic cases and 20.2% (37 out of 183) of severely anaemic cases had instrumental deliveries. 12% (22 out of183) of severely anaemic group had caesarean delivery with fetal distress being the most common indication.

Table 2: Labour complications among cases and controls

Sl. No	Labour complications	Cases N (%)	Controls N (%)	X^2 value, df@	p value#
	CCF				
1	Present	14 (7)	0	14.5, 1	
	Absent	186 (93)	200 (100)		<0.001*
	Total	200 (100)	200 (100)		
	Retained placenta				
2	Present	1 (0.5)	0		
	Absent	199 (99.5)	200 (100)	1.003,1	0.31
	Total	200 (100)	200 (100)		
	PPH				
3	Present	29 (14.5)	2 (1)	25.49, 1	<0.001*
	Absent	171 (85.5)	198 (99)		
	Total	200 (100)	200 (100)		

NOTE: X^2 – Chi square value, @ df- degrees of freedom, # p value based on Chi square test, * statistically significant p value (<0.05)

7% (14 out of 200) of cases group had CCF when compared to control group which had no CCF.14.5% (29 out of 200) of cases had PPH when compared to 1% (2 out of 200) in controls.0.5% (1 out of 200) of cases had retained placenta as against no cases among controls(Table 2).

Table 3: Association of puerperal complications among cases and controls

Sl. No	Puerperal complications	Cases N (%)	Controls N (%)	X^2 value, df@	p value#
	Puerperal pyrexia				
1	Present	16 (8)	2 (1)	11.4, 1	
	Absent	184 (92)	198 (99)		0.001*
	Total	200 (100)	200 (100)		
	Puerperal sepsis				
2	Present	15 (7.5)	0		
	Absent	185 (92.5)	200 (100)	15.58,1	<0.001*
	Total	200 (100)	200 (100)		
	Sub involution				
3	Present	12 (6)	0	12.37, 1	<0.001*
	Absent	188 (94)	200 (100)		
	Total	200 (100)	200 (100)		

NOTE: X^2 – Chi square value, @ df- degrees of freedom, # p value based on Chi square test, * statistically significant p value (<0.05)

29.5% (5 out of 17) of very severely anaemic cases and 6% (11 out of 183) of severely anaemic cases had puerperal pyrexia.47.1% (8 out of 17) of very severely anaemic cases and 3.8% (7 out of 183) of severely anaemic cases had puerperal sepsis.35.3% (6 out of 17) of very severely anaemic cases and 3.3% (6 out of 183)

of severely anaemic cases had sub involution. In cases, 8% (16 out of 200) had puerperal pyrexia, 7.5% (15 out of 200) had puerperal sepsis, 6%(12 out of 200) had sub involution. In control group, 1% had puerperal pyrexia. No subjects among controls of puerperal sepsis and sub involution.(Table 3)

Table 4: Puerperal complications among cases and controls

Sl. No.	Complication	Cases N (%)	Controls N (%)	X^2 value, df@	p value#
4	**Lactation failure**				
	Present	9 (4.5)	0	9.2, 1	0.002*
	Absent	191 (95.5)	200 (100)		
	Total	200 (100)	200 (100)		
5	**Episiotomy gaping**				
	Present	17 (8.5)	3 (1.5)	10.31, 1	0.001*
	Absent	183 (91.5)	197 (98.5)		
	Total	200 (100)	200 (100)		
6	**LSCS gaping**				
	Present	2 (1)	1 (0.5)	0.336, 1	0.56
	Absent	198 (99)	199 (99.5)		
	Total	200 (100)	200 (100)		

NOTE: X^2 – Chi square value, @ df- degrees of freedom, # p value based on Chi square test,   * statistically significant p value (<0.05)

29.5% (5 out of 17) of very severely anaemic cases and 2.2% (4 out of 183) of severely anaemic cases had lactational failure.35.3% (6 out of 17) of very severely anaemic cases and 6% (11 out of 183) of severely anaemic cases had episiotomy wound gaping.1.1% (2 out of 183) had caesarean section in severely anaemic group

Puerperal complications among cases and controls shown in table 5&6.In cases, 4.5% (9 out of 200) had lactation failure, 8.5% (17 out of 200) had episiotomy wound gaping and 1% (2 out of 200) had caesarean section wound gaping. In control group, 1.5% had episiotomy wound gaping, 0.5% had caesarean section wound gaping. No cases of lactation failure(Table 4)

The maternal morbidity among total cases was 26.5% (53 out of 200) when compared to 3.5% (7 out of 200) among controls. There was no maternal mortality in the study population.

Neonatal complications(Figure 1),64.7% (9 out of 17) of very severely anaemic cases and 34.4% (63 out of 183)of severely anaemic group had preterm births.35.3% (6 out of 17) of very severely anaemic and 23.5% (43 out of 183) of severely anaemic group babies had IUGR. There was one still birth in very severely anaemic group.58.8% (10 out of 17) of babies of very severely anaemic group and 12.6% (23out of 183) of babies of severely anaemic group were admitted to NICU. Preterm birth rate was 37% (74 out of 200) among cases when compared to 4% (8 out of 200) among controls.24.5% (49 out of 200) among the cases and 5% (10 out of 200) among controls were IUGR babies.0.5% (1 out of 200) of cases had still birth when compared to controls where there were no stillbirths.16.5% (33 out of 200) among cases and 6% (12 out of 200) among controls.88.2% (15 out of 17) of very severely anaemic cases and 34.4% (63 out of183) of severely anaemic cases had neonate with

birth weight <2.5kg.The neonatal morbidity was 52.9% (9 out of 17) among very severely anaemic group and 13.1% (24 out of 183) among severely anaemic group. The neonatal mortality was 17.6% (3 out of 17) among very severely anaemic group and 1.1% (2 out of 183) among severely anaemic group.

The overall neonatal mortality was 2.5% (5 out of 200) among cases when compared to controls where there was no neonatal mortality. The average number of blood transfusion is 3 per subject among very severe anaemia group and 2 per subject in severe anaemia subjects as against no blood transfusion among control group. The average doses of injectable iron given postpartum is 4 per subject in case group as against no injectable iron among controls.

DISCUSSION

Majority of subjects in the study group belonged to 20-29 yrs age group comparable to the study conducted by Rameshwari et al [4] and Khandait WD et al [5] in which 70% of subjects.Low socio economic status is a risk factor for anaemia due to poor nutrition, improper sanitation and unhygienic habits. This may also lead to worm infestations which is very common in developing countries like India.In the present study 86% of the cases belonged to low socioeconomic group comparable to studies conducted by Rameshwari et al [4] and Nirmala Devi.B et al [6] in which the 78% and 88% of anaemic subjects belonged to low socioeconomic groups respectively.

In the present study 70 % of the cases were unbooked compared to 15% unbooked controls comparable to studies done by Rameshwari et al[4], Nirmala Devi et al [6] and Chinthan Upadhyay et al [7] in which 76% ,67% and 74.2% of cases were unbooked respectively.In the present study 62% of cases were multigravida as against 38% of controls comparable to studies conducted by Awasthi et al [3], Nirmala Devi .B et al [6,8,9] (65.5% and 68%).In this study 59.7% of multigravida cases and 36.8% of multigravida controls had birth spacing <2 years comparable to studies done by Chinthan Upadhyay et al (2013)46 and Khandhail WD et al[5].

In our study 66% of cases had vaginal delivery as compared to 83% among controls. In present study 23% of cases and 9% of controls had assisted vaginal deliveries comparable to study by Shrivastava M et al [10]. In the present study 11% of cases and 8% controls had caesarean delivery which can be compared to study conducted by Awasti et al [3] where 20% of cases and 5% of controls had caesarean deliveries.

Anaemic patients cannot tolerate even the normal blood loss during the delivery. Even the minimal blood loss may be detrimental and may lead to complications like PPH. In the present study 14.5% among the cases had PPH as against 1% among the control group. All were atonic PPH which were managed medically. These results were comparable to the studies done by Riffat J. et al and Agarwal et al [11] in which 9.8% and 10% of cases had PPH respectively.

In our study 0.5% of cases had retained placenta as compared to 0% among controls comparable to study done by Awasthi et al [3] in which 2% of cases had retained placenta. In this study 7% of cases had CCF as against 0% among controls similar to studies done by Rameshwari et al [4] and Alka Batar et al [12] in which 8% and 6.15% of cases had CCF.

In this study 8% cases had puerperal pyrexia as against 1% among controls comparable to study by Rohilla et al[9] . In the present study 7.5% of cases had puerperal sepsis as against 0% among controls comparable to study done by Alka Batar et al [12](10%). In our study 6% of cases had subinvolution..In our study 4.5% of cases had lactation failure as against to 0% among controls comparable to study by S Patra et al [13] (6.9%). In this study 9.5% of cases had wound gaping (Episiotomy + post LSCS) as against 2 % of controls similar to the study by Riffat J. et al [14].

24.1% of cases and 5% controls had IUGR births which can be compared to study done by Chinthan Upadhyay et al [7] where 28% of cases had IUGR births. In this study babies of 16.5% of cases and 6% of controls had NICU admission.39% of cases and 20% of controls had LBW(<2.5kg) which can be compared to study done by Awasthi et al [3] in which 37.5% of cases had LBW babies. Perinatal mortality was 5% in our present study comparable to 11% in the study done by Chinthan Upadhyay et al [7]. The most common cause of PNM in both was RDS.

Conclusion: The prevalence of anaemia in pregnant women is high due to illiteracy, ignorance, low socio economic status, lack of proper antenatal care, close birth spacing, multiparity.

Early marriages and teenage pregnancies should be avoided. Awareness to be created regarding dietary habits , personal hygiene, proper sanitation, small family norms, birth spacing, regular antenatal checkups,food fortification, regular intake of iron and contraception. Timely identification of severe anaemia and its associated complications is very crucial in reducing the fetomaternal morbidity and mortality.

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Prospective Study of Bilateral Uterine Artery and Ovarian Artery Ligation for Arresting Postpartum Hemorrhage During LSCS Done Over Two Year Period

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ABSTRACT

Postpartum hemorrhage (PPH) is the single most significant cause of maternal death worldwide.Caesarean section (LSCS) is one of the commonest surgeries done and excessive blood loss is a major complication of the procedure. If PPH is encountered during LSCS it's a dreaded condition which may lead to maternal morbidity.

An institutional based prospective study was conducted from November 2014 to August 2016.Thirty women who had PPH during LSCS after failed medical line of treatment underwent bilateral uterine and ovarian artery ligation. The outcome was analyzed in terms of effectiveness of procedure in controlling bleeding, need of blood transfusion, need of additional procedures, possibility of avoiding hysterectomy and maternal outcome.

Bilateral uterine and ovarian artery ligation is faster and effective method in controlling bleeding. It avoids the need of an expert in doing the time consuming procedure like internal artery ligation. It also helps in conserving the uterus for all those women who wish to bear children.

Keywords: *LSCS,uterine atonicity, PPH,uterine and ovarian artery.*

INTRODUCTION

Obstetric hemorrhage is the most feared obstetric emergency that can occur to any woman at childbirth. More than half of all maternal deaths occur within 24 hours of delivery, most commonly from excessive bleeding.If unattended, the hemorrhage can kill even a healthy woman in no time. It is estimated that worldwide 1, 40,000 women die of postpartum hemorrhage each year[1].

The incidence of PPH is between 4 to 6 % when blood loss is estimated subjectively and increases to 10% when objective estimates are used. Incidence is 3.9% with vaginal deliveries and 6.4% with cesarean deliveries.[1-2].

In addition to death, serious morbidity may follow PPH like adult respiratory distress syndrome, coagulopathy, shock, loss of fertility, and pituitary necrosis (Sheehan syndrome).The rate of PPH has increased due to increased maternal age at child birth, cesarean deliveries, multiple pregnancies, macrosomia, induced labours and syntocinon augmentation.[3,4] Uterine atony is a primary cause of PPH in 70% of cases.[5, 9]

Postpartum hemorrhage (WHO – 1990) is defined as the loss of more than 500ml of blood from the genital tract at vaginal delivery, 1000 ml at cesarean section or 1500 ml at cesarean hysterectomy.[5] ACOG has suggested a clinically more relevant definition of PPH as a hematocrit drop by 10% or haemorrhage that requires immediate transfusion.[6]

Obstetric hemorrhage can be primary PPH occurring within 24 h postpartum or secondary , occurring between

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24 hrs to 6 weeks postpartum. Causes of post partum hemorrhage are the four T' namely, 1)Tone: Uterine atony2)Trauma: Of any part of the genital tract, inverted uterus3)Tissue: Retained placenta, invasive placenta 4) Thrombin :Coagulopathy.[7]

PPH is quantified as blood loss of 500ml or more in vaginal delivery , 750 ml or more in cesarean section ,change in hematocrit > 10% or when rapidity of blood loss > 150ml/min.When medical therapy is unsuccessful surgical intervention may be required to controlPPH. Proven surgical procedures are uterine packing,uterine and ovarian ligation, B lynch sutures, internal iliac artery ligation and lastly hysterectomy.

During pregnancy 90% of the blood supply to uterus comes from uterine artery and rest from ovarian arteries. Occlusion of uterine arteries reduces most of uterine flow and causes uterine ischaemia.Occlusion of ovarian arteries causes additional deprivation of blood supply .Thus ligation of uterine and ovarian artery helps in reducing blood loss effectively. Theprocedure is simple, takes less time, compared to other methods .and helps in saving the life of women and avoids hysterectomy in stabilized patients.

METHODOLOGY

Source of data: The present study was a prospective study conducted in the Dept. of Obstetrics and Gynaecology. J.J.M. Medical College, Davangere, Karnataka, from November 2014 to August 2016.

Inclusion criteria: 30 caseswho had atonic PPH during LSCS even after medical therapy were selected for bilateral uterine and ovarian arteries ligation.

Exclusion criteria: Cases with adherent placenta, rupture uterus, coagulopathies with deranged hematological indices.

Pre-structural proforma was used to obtain – basic demographic data regarding the patient, history, general physical examination, obstetric/systemic examination and relevant investigations done according to the particular case.

After delivery of fetus by LSCS, active management was done to control PPH.All cases were managed by uterine massage, bimanual compression, oxytocin infusion up to 40IU, methyl ergometrine 0.2 mg (if mother was not hypertensive) 15-methyl-prostaglandin F-2α 250μgms and blood transfusion [9,10].

After inadequate response indicated by persisting uterine atonicity ,bleeding, tachycardia (110b/min) ,hypotension(90/60 mm Hg) the patients were taken for stepwise uterine and ovarian artery ligation

Technique of uterine and ovarian artery ligation[11,12]: In cases of uncontrolled PPHafter vaginal delivery who are taken for exploratory laparotomy the uterus is pulled upwards to expose the lower part of the broad ligament. Pulsation of the uterine artery at the junction of the uterus and the cervix are felt. The uterine artery is ligated at the upper part of the lower uterine segment. In case of LSCS the ligation is done 2-3cms below the level uterine incision. The uterine artery and vein are ligated by passing the needle 2-3cm medial to the vessels, including almost full thickness of the myometrium, and then bringing it through the broad ligament, in the avascular area lateral to the vessel. The sutures are tied securely. Ligation is repeated on the other side.

A second stitch can be placed if the above stitch is ineffective, and for cases with continued lower segment haemorrhage. This would obliterate most of the branches of the uterine artery to the lower segment and a branch that extends to the cervix. If there is continued bleeding, unilateral or bilateral ovarian vessel ligation is performed.An avascular area in the mesoovarian is chosen to place the ligatures around the utero ovarian arterial anastomoses.

The method is also called as Stepwise uterine devascularisation(Fig 1).If bleeding is not controlled by one step thenext step is taken until bleeding stops. The steps are:

(a) Unilateral uterine vessel ligation

(b) Bilateral uterine vessel ligation

(c) Low uterine vessel ligation

(d) Unilateral ovarian vessel ligation

(e) Bilateral ovarian vessel ligation.
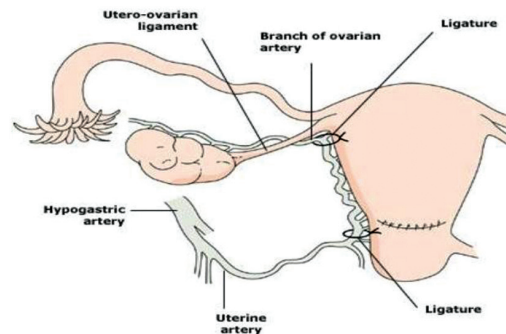
Fig. 1

Patients were checked for hemodynamic stability .Blood transfusion was done in required cases. Patients who continued to be unstable underwent suitable procedures(B lynch, bilateral internal iliac artery ligation or hysterectomy) and were monitored carefully in the post-operative period.

The success rate, need of blood transfusion, additional procedures for controlling PPH and maternal outcome were analyzed associated with the procedure.

Statistical Analysis: Data wasanalyzed using paired T test and chi-square test.

RESULTS

30 casesincluded both referred and inpatient patients. 24 cases (80%) were referred from primary health centers and 6 (20%)were inpatient cases(Table 1).

Out of 30 women 20 cases(66.7%) were multigravida , 9 cases(30.0%) were primigravida and 1 grand multigravida. 73.3% were unbooked cases.

Table 1: Number of referred cases (n=30)

Referred	Frequency	Percent
Yes	24	80
No	06	20

Table 2: Indication for LSCS (n =30)

Indication for LSCS	Frequency	Percent
Abruptioplacenta grade II	4	13.3
Abruptio placenta with unfavourable cervix	1	3.3
Placenta previa type II b	3	10
Placenta previa type IV	1	3.3
Placenta previa type III	1	3.3
Placenta previa type II b with breech Presentation	1	3.3
Fetal distress	3	10
obstructed labor with fetal distress	1	3.3
Prolonged labor with fetal distress	3	10
obstructed labor	4	13.3
1st twin by breech	2	6.6
Prolonged labor	1	3.3
Not willing for VBAC	4	13.3
Cord prolapse	1	3.3
Total	**30**	**100**

All cases underwent LSCS due to various indications as shown in(Table 2).

11 cases (36.6%) had cesarean section due to antepartum hemorrhage, 7 cases (23.3%) due to fetal distress , 13.3% for obstructed labor and 13.3% for previous LSCS.

Table 3: Success by uterine and ovarian arteries ligation (n=30)

Surgical method to control PPH	No of cases	Percent
B/L uterine + Ovarian artery ligation	27	90
B-Lynch suture	1	3.3
B/L internal iliac artery ligation	1	3.3
Hysterectomy	1	3.3
Total	**30**	**100**

Bilateral uterine and ovarian arteries ligation were performed in all 30 cases. In 27 cases (90%) PPH was controlled successfully (Table 3). 2 cases with placenta previa needed further management with B lynch suture and bilateral internal iliac artery ligation and 1 case with uterine atony underwent cesarean hysterectomy.

Table 4: Blood transfusion

Number of units	Frequency	Percent
1-2 units	24	80
3-4 units	6	20
Total	**30**	**100**

Majority of cases 24(80%) received 1-2 units blood transfusion.

Table 5: Maternal outcome

Maternal outcome	Frequency	Percent
Postoperative fever with UTI	2	6.6
Satisfactory	28	93.4
Total	**30**	**100**

Maternal outcome was satisfactory in 28 cases (93.4%) and 2 cases (6.6%) had postoperative fever with UTI.

Table 6: Success rate of bilateral uterine and ovarian arteries ligation

Study	Success Rate	Failure Rate	Study Period	No. of cases
Our study	90%	10%	2 years	30
Fahmy K[13]	80%	20%	-	32
O`Leary JA[14]	96.2%	3.77%	30 years	265
AbdRabbo SA[15]	95.8%	3.9%	-	103
HalderAtin et al[16]	92.85%	7.15%	3 years	42

In an extensive study by O' Leary over a period of 30 yrs , PPH was successfully controlled in 96% of cases by uterine and ovarian artery ligation alone. Fahmy K and AbdRabbo studies also have proved the success rate of the procedure in around 95 %of cases which is consistent with our study.(Table 5)

DISCUSSION

When medical therapy is unsuccessful, surgical intervention may be required to control PPH to ensure maternal survival.Proven surgical procedures are uterine and ovarian artery ligation, internal iliac artery ligation and hysterectomy .Internal iliac artery ligation ,although a lifesaving procedure   requires more time, expertise in dissection and experience. Here the chances of injuring other vessels is high. Hysterectomy is the definite surgery for uncontrollable PPH but women have got to live with amenorrhoea and the wish to have children has to be sacrificed forever.

During pregnancy 90% of the blood supply to the uterus comes from the uterine arteries and rest from the ovarian and vaginal arteries. Hence occlusion of the uterine arteries reduces most of the uterine blood flow and ligation of the ovarian vessels result in additional deprivation of the blood supply to the uterus.

In uncontrollable hemorrhage the uterine arteries lose their ability to constrict because of an unidentified mechanism and their ligation seems to justifiable treatment1.

CONCLUSION

In India about 15% to 25 % mothers die due to PPH without timely diagnosis and management.

After inadequate response to medical line of therapy doing uterine devascularization by bilateral uterine and ovarian artery ligation is effective, simple and safe method for controlling PPH . It'salso a lifesaving alternative to hysterectomy.Thus arterial ligation controls PPH, preserves reproductive function and avoids hysterectomy and related consequences

The survival rate in this study was 100%, which may in part be because of simplicity, safety, and short duration of the procedure, and in part because of the early diagnosis, decision, and good pre-operative and post-operative management.

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Attitude of Tobacco Users among 13-18 Year School Going Children of Urban Meerut

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ABSTRACT

Introduction: Tobacco use is the leading cause of preventable deaths world over, more so in developing countries. Tobacco use is a male dominant phenomenon among children and adolescent in India. Most of them in developing countries because of increasing level of use and dire public health implication, tobacco use among people have been referred to as both a pediatric disease and a pediatric epidemic.

Aims & Objective: To find out the attitude of Tobacco users among 13-18 year school going children of urban Meerut.

Methods: A Cross-sectional study was conducted among school going children between 13 -18 years of age in Urban Meerut Two government and two private schools CBSC affiliated were selected randomly by a list of all the schools made available by listing all the schools in Meerut. sample size was 800 and equally distributed 400 government & 400 private school.

Results: In the study, 15 years (34.1%) was the most common age, male predominance ((59.6%) was observed as compared to female (40.4%) amongst study population . Hindu (76.9 %) was the most common religion, nuclear family was the most common type of family (78.5 %). 37.4 % of study population has a family size of 5 members followed by family size of 4 members (32.6%). 80.1% of study population belongs to urban area. The early age of initiation underscores the urgent need to intervene and protect this vulnerable group from falling prey to this addiction. In our study 62.3 % of the study population believes smoking cigarette looks less attractive. 51.5% of the study population had perception regarding tobacco user as stupid. In our study, 80.90 % of opinion of raise cost of tobacco product use by government will control it. 35.90% of study population decreased use was the most common impact of no tobacco advertisement by the print media and electronic media.

Keywords: School going children, Attitude of tobacco, smoking, smokeless.

INTRODUCTION

Tobacco use is the leading cause of preventable deaths world over, more so in developing countries. In India alone, nearly 1 in 10 adolescents in the age group 13-15 year have ever smoked cigarettes and almost half of these reports initiating tobacco use before 10 year of age. Most of them in developing countries because of increasing level of use and dire public health implication, tobacco use among people have been referred to as both a pediatric disease and a pediatric epidemic. [1] Tobacco use is a male dominant phenomenon among children and adolescent in India. In some countries like China, Fiji, Jordan and Venezuela, smoking is rather more common among females. [2] The tobacco situation in India is unique because of a vast spectrum of tobacco products available for smoking as well as smokeless use.[3]

A typical smoker will take 10 puffs on a cigarette over a period of 5 minutes that the cigarette is lit. Thus, a person who smokes about 1-1/2 packs (30 cigarettes)

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daily, gets 300 "hits" of nicotine to the brain each day. These factors contribute considerably to nicotine's highly addictive nature. [4] Smoking of cigarette particularly bidis and chewing tobacco (smokeless use) is an age-old practice in India. However, according to anecdotal evidence with the changes in the dynamics of societies, the prevalence of smoking among women and young children has increased by many folds and is at present a significant public health problem.[5]

High incidence of oral cancer, the government is currently discussing a ban on chewing tobacco after some recent surveys among school children in Bombay showed that 12-18% of high school students were addicted to pan masala. Changes in prevalence of tobacco use in adolescents are important to monitor, since increased use by young people might be a precursor to increased rates of smoking in the population. [6] There are only a few studies on prevalence and initiation of smoking and smokeless tobacco use among children in our country. The risks of tobacco use are highest among those who start early and continue its use for a long period. The early age of initiation underscores the urgent need to intervene and protect this vulnerable group from falling prey to this addiction. The most common reasons cited for children to start using tobacco are peer pressure, parental tobacco habits and pocket money given to children.[7]

The present cross-sectional study was undertaken to find the prevalence of tobacco use and its determinants in school going children of Meerut (North India).

Aims & Objective: To find out the attitude of Tobacco users among 13-18 year school going children of urban Meerut.

MATERIAL AND METHOD

A Cross-sectional study was conducted among 800 school going children between 13 -18 years of age in Urban Meerut. Two government and two private schools were randomly selected by listing all the schools in Meerut city. The sample was equally distributed among government and private schools of Meerut city List of all the CBSE affiliated schools was taken from regional office of CBSE Dehradoon and same was obtained from office of the Ucchattar Madhyamic Shiksha Board Meerut . The principals of the schools were informed in writing about the purpose of the survey and permission for the same was taken from them. Students were told to

participate in the study voluntarily and verbal consent was obtained from their parents with help of class teachers. Children were explained about how to fill up the questionnaire and to provide authentic information. They were assured that all information would be kept confidential. English questionnaire were provided and explained to school students.

Ethical Approval was taken from the institutional ethics committee of Subharti Medical College Meerut. The duration of study was February 2015 to January 2016. SPSS version 19 by using proportion, chi-square tests and other appropriate tests was used.

RESULTS

Table 1: Distribution of study population according to socio-demographic variables

Variables	Frequency	%
School		
Darshan Public Academy	200	25.0
Godwin Public School	200	25.0
Kendriya Vidyalaya Punjab Line	200	25.0
Kendriya Vidyalaya Sikh Line	200	25.0
Class		
Ix	200	25.0
X	200	25.0
XI	200	25.0
XII	200	25.0
Age (Year)		
13	00	0.0
14	144	18.0
15	273	34.1
16	185	23.1
17	143	17.9
18	55	6.9
Sex		
Male	477	59.6
Female	323	40.4
Religion		
Hindu	615	76.9
Muslim	94	11.8
Cristian	14	1.8
Sikh	77	9.6

Conted…

Family			
Nuclear	628	78.5
Joint	172	21.5
Family Size		
≤3	70	8.8
4	261	32.6
5	299	37.4
6	89	11.1
>6	81	10.1
Average Monthly Income		
≤ 10000	91	11.4
10000-20000	244	30.5
20000-30000	257	32.1
30000-40000	83	10.4
40000-50000	70	8.8
>50000	55	6.9
Address		
Urban	641	80.1
Rural	119	14.9
Peri Urban	40	5.0
	800	100.0

In the study, 15 years (34.1%) was the most common age amongst study population followed by 16 years (23.15) and 14 years (18%). Male predominance ((59.6%) was observed as compared to female (40.4%) amongst study population . Hindu (76.9 %) was the most common religion followed by Muslim (11.8%) and Sikh (9.6%) Nuclear family was the most common type of family (78.5 %). 37.4 % of study population has a family size of 5 members followed by family size of 4 members (32.6%). 80.1% of study population belongs to urban area.

Table 2: Perception about looking attractive due to smoking (smoking cigarrette) among study population (n=800)

Attractive Looks (Smoking Cigarrete)	Frequency	Percent
More Attractive	64	8.0
Less Attractive	498	62.3
No Difference From Non Smokers	238	29.8
Total	**800**	**100.0**

Table no. 2 suggested that 62.3 % of the study population believes smoking cigarette looks Less attractive.

Table 3: Perception about the personality of the tobacco user`s (smoke/chewer) (n=800)

Perception Regarding Tobacco User	Frequency	Percent
Lack confidence	81	10.1
Stupid	412	51.5
Loser	101	12.6
Macho	42	5.3
Nothing	164	20.5
Total	**800**	**100.0**

Table no. 3 suggested that 51.5% of the study population had perception regarding tobacco user as stupid

Table 4: Perception about effectivity of the tobacco control policy government on ever users (n=110)

Effectivity Of Government Policy	Frequency	Percent
Yes	89	80.90
No	21	19.09

Table no. 4. suggested that 80.90 % of respondents opinion of raise cost of tobacco product use by government will control it

Table 5: Perception about impact of negative advertisement of the print media on tobacco consuption any study population (n=78)

Impact Of Negative Advertisement	Frequency	Percent
Decreased use	28	35.90
No effect	2	2.5
Ignored the advertisement	22	28.21
Quitted	26	33.33

Table no. 5 suggested that 35.90% of study population decreased use was the most common impact of no tobacco advertisement by the print media and electronic media

DISCUSSION

In this study, 15 years (34.1%) was the most common age amongst study population followed by 16 years (23.15) and 14 years (18%). According to Gajalakshmi CK et al (2000) in their article named Global patterns of smoking

and smoking-attributable mortality ,15 years (34.1%) was the most common age amongst study population followed by 16 years (23.15) and 14 years (18%).[8]

In our study 62.3 % of the study population believes smoking cigarette looks less attractive. As per India (Ages 13-15) Global Youth Tobacco Survey (GYTS) revealed that 21.1% think boys and 15.6% think girls who smoke look more attractive.[9]

In our study , 51.5% of the study population had perception regarding tobacco user as stupid. A study done by Raina et al.(2015) revealed that age (13 to 15) year study participants (96.6%) had negative perceptions about smokers, which was that they lacked confidence. Almost 82.8% of the study population had displayed strong attitude toward banning smoking at all the public places and 40.2% of the study participants were of the opinion that smoking does not help in social acceptance into friend circle, and most of them (36.82%) were aged 14 years, so their negative attitude toward smoking might be due to observance of local customs in which smoking is not considered an acceptable behavior.[10]

In our study 80.90 % of opinion of raise cost of tobacco product use by government will control it. In India, since 1975, it is mandatory to display a statutory health warning on all packages and advertisements of cigarettes because of the Cigarettes (Regulation of Production, Supply and Distribution) Act, enacted by the Government of India (GOI). Further restrictions on tobacco trade were initiated along with efforts to bring forth a comprehensive legislation for tobacco control during the 1980s and 1990s. The Indian Parliament passed the Cigarettes and Other tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply and Distribution) Bill, 2003 in April 2003. This Bill became an Act on 18 May 2003 – COTPA Rules were formulated and enforced from 1 May 2004. The Act is applicable to all products containing tobacco in any form, and extends to the whole of India.[11]

The key provisions of COTPA -2003 are as follows:

- Prohibition of smoking in public places (including indoor workplaces). This has been implemented from 2nd October 2008 in the whole of India.

- Prohibition of advertisement, direct and indirect (point-of-sale advertising is permitted), sponsorship and promotion of tobacco products.

- Prohibition of sales to minors (tobacco products cannot be sold to children less than 18 years of age and cannot be sold within a radius of 100 yards of any educational institutions).

- Regulation of health warning in tobacco products packs. English and one more Indian language to be used for health warnings on tobacco packs. Pictorial health warnings also to be included.

- Regulation and testing of tar and nicotine contents of tobacco products and declaring on tobacco products packages.

35.90% of study population decreased use was the most common impact of no tobacco advertisement by the print media and electronic media. Advertisement and media messages about guthka/smoking/pan masala etc seen on Television , Media and Social gatherings.

Almost all students were exposed to cigarette and gutka advertisements in different media.

As per Gururaj et al.(2007),Conducted a study in school going children of Karnataka of age group 13-15 years there was a greater exposure to media messages on tobacco in the metropolis region (25.7% to 52.2%) when compared to transitionalareas (21.3% to 39.4%) or even rural communities (28.3% 47.8%). Children had not come across many messages on bidis in the Television, newspapers or magazines. [12] A study done by Madan et al.(2005)Conducted a study in school going children of Chennai of age group 13-15 years almost everyone reported watching a lot of cigarette advertisements on TV, whereas about half reported watching advertisements on other medias like outdoor hoardings (45.7%), newspapers (65.3%) and social events (67.4%).[13]

The latter included sport events, film award shows, cultural event etc.

As per India (Ages 13-15) Global Youth Tobacco Survey (GYTS), 2009 (22)

- 77.5% saw anti-smoking media messages, in the past 30 days

- 74.4% saw pro-cigarette ads on billboards, in the past 30 days

- 8.1% were offered free cigarettes by a tobacco company representative

RECOMMENDATIONS

- School authorities should take serious step to check the initiation of tobacco use among student starting from 6-7 standard itself.

- In early classes their should be a lesson in science subject on hazards of tobacco so that the students develop apprehension about tobacco use.

- Public health specialist should regularly visit the school in the morning assembly and stress the point that there is nothing stylish or smart about the smoking or tobacco chewing.

- They should also organize FGD'S(focus group discussion) with the students of the school from VII class onwards.

- Public health specialist should interact with parents and senior teachers during parents and teacher meeting highlighting the fact to the parents that if they smoke or chew tobacco then they may be encouraging their children to do the same in future.

- There should be anti tobacco banners or posters at important places of the school premises.

CONCLUSION

In this study 15 years (34.1%) was the most common age amongst using tobacco currently. Which is cause of worry. Male predominance ((59.6%) was observed as compared to female (40.4%) amongst study population . Hindu (76.9 %) was the most common religion. Nuclear family was the most common type of family (78.5 %). 37.4 % of study population has a family size of 5 members. 80.1% of study population belongs to urban area. Among all tobacco user around half of the student were using both smoke and smokeless form of tobacco. Peer pressure, parental history of tobacco used male sex, desire to look stylist were the main determinants of tobacco use . The early age of initiation underscores the urgent need to intervene and protect this vulnerable group from falling prey to this addiction.

In this study 62.3 % of the study population believes smoking cigarette looks less attractive. 51.5% of the study population had perception regarding tobacco user as stupid. 80.90 % of opinion of raise cost of tobacco product use by government will control it. 35.90% of study population decreased use was the most common

impact of no tobacco advertisement by the print media and electronic media.

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The Efficacy of Mindfulness Therapy on Mindfulness Attention Awareness and Perception of Disease in Women with Breast Cancer

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ABSTRACT

The purpose of present research was reviewing the efficacy of mindfulness therapy on mindfulness attention awareness and perception of disease in women with Breast Cancer. The method of this study was semi experimental and the plan was two-group pretest-posttest. The statistical population included all women with breast cancer in Tehran. The sample group was forty women with breast cancer, who selected by sampling method from Imam Khomeini Hospital and randomly assigned to two groups. The test group treated with mindfulness intervention in eight sessions according to the package. Research tools ware short Form standardized Questionnaire of illness Perception (Brief-IPQ) and the perception of condition index (MASS). The validity and reliability of these tools confirmed in several researches. Data analyzed using analysis of multivariate covariance. The result showed that the hypothesis- there is a significant difference in adjustment variables of mindfulness and perception of disease in the test group compared with control group – confirmed (P< 0.05).

Keywords: *Mindfulness Therapy, Mindfulness attention awareness, Perception of disease, Breast cancer*

INTRODUCTION

Cancer is a chronic disease, which causes the socio-economic and psychological problem for the patient, the family, and society. Breast cancer is the most prevalent cancer among women, which accounted 23% of all cancers and 14% of female mortality due to cancer[1]. World statistics indicate an increased incidence of breast cancer and faster increasing in developing countries, including Iran[2]. According to report of World Health Organization, 1.38 million of women diagnosed with breast cancer yearly and almost 58% of deaths because of breast cancer are in less developed countries[3]. Incidence of breast cancer doubled over the past three decades in Iran[4]. More than 8000 new cases of breast cancer diagnosed in Iran every year[5]. 5-year survival rate for these patients is 40-80 percent[3]. Breast cancer has mental aspect in addition to medical and objective aspects[6]. Diagnosing cancer is one of the most unpleasant events that may occur during a woman's life. Women with breast cancer often associated with intense psychological distress at the time of awareness of cancer as well as treatment period[7]. Losing one or both breasts create feeling of amputation. The lack of this organ cause changing the image, reduce feelings of women, decreased sense of attractiveness and sex appeal as well as anxiety, depression, lack of motivation, embarrassment, and the fear of recurrence, rejection and thoughts about death[8]. These patients for returning to their normal lives need help to compatibility and meet their impaired need[1]. Cognitive psychologist use various interpreting patterns to explain the factors influencing the awareness and improve knowledge. In this regard, the concept of mindfulness attention awareness considered recently. Brown and Ryan described mindfulness attention awareness or are living at present as quality of awareness and attention to the experience of every moment of life[9].

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Mindfulness is awareness of the current reality and awareness of personal emotions. This concept rooted in Buddhism and other religious schools where awareness promoted actively[10]. Lack of extreme preoccupation to the past or the future, awareness of personal emotions, optimal performance of short-term memory in track events, the ability to focus on issues, and the lack of acceleration in food and automatically perform the lives are the most important examples of mindfulness. These items provide favorable cognitive conditions in dealing with issues of life[11]. Nowadays, we believed that mindfulness increase a person's well-being. Research showed that negative Affection, anger, rumination, social anxiety and self-help related to lack of mindfulness and has direct relationship with positive emotion, optimism, respect, and clearly. Several studies have showed that mindfulness training to patients with mood and anxiety disorders caused a significant improvement of mental health as well as its usefulness had been shown as an intervention method for a range of chronic psychiatric disorders. Generally, mindfulness-based treatment is effective for people with mood swings, stress, eating disorders, and prevention of recurrence of depression [12]. Few studies had done about impact of understanding the disease on patients seeking help with breast cancer symptoms. Broadbent et al. study showed that assessment and understanding the signs is a very important step that affects future behavior of patient and one of the important variables in predicting the delay in seeking help in patients with symptoms of breast cancer [13]. Studies showed that negative perceptions with increased disability and slower recovery in the future is independent of the intensity and initial medical conditions[14]. Todays, mindfulness is one of the world's treatment, which is applicable for healthy and sick people in different situations. Mindfulness is full flexibility with regard to the present experiences with the acceptant state without any judgment[15]. process of accepting carried out without analysis but using mainly and repeated simple empirical exercises in which individuals learn to identify current phenomena in real time (such as body allergies, thoughts and feelings) and accepted as it emerged. Mindfulness used for both allergic and desensitization process. A person desensitize by reducing and avoiding becoming more sensitive by attention to communicate emotional states and their automatic responses to aversive negative aspects of events. Nature of allergic and desensitization mindfulness cause increasing mental flexibility, behavioral and emotional responses, and the development of levels of coping skills and decrease the negative attitudes and emotions [16]. In fact, mindfulness cause sense of peace and hope and a better ability to cope with stress, increase self-confidence, and internal control[17]. The purpose of present research was reviewing the efficacy of mindfulness therapy on mindfulness attention awareness and perception of disease in women with Breast Cancer.

METHOD OF RESEARCH

The method of this study was semi experimental and the plan was two-group pretest-posttest. Pretest-posttest plan include test group and equivalent control group. Both groups measured two times. The first measurement conducted by performing a pretest before the training, and the second measurement conducted after the completion of the required training. 20 patients in the experimental group and 20 patients in the control group classified using random sampling method.

Population, sample, and method of sampling: The statistical population included all women with breast cancer in Tehran. The sampling method was available way. The sample group was forty women with breast cancer, who selected by sampling method from Imam Khomeini Hospital and randomly assigned to two test and control groups.

MEASUREMENT TOOLS

Illness Perception: We used short form standardized perception questionnaire (Brief-IPQ) (Elizabeth Broadbent, 2002) to assess women's perceptions and beliefs about breast cancer symptoms illnessn. The advantage of this type of questionnaire is fast measurement of positive perception of patient about the disease. The questionnaire included nine questions (8 questions and 1 question for causal scale in the version of the IPQ-R). All the questions measured on the continuum 0-10 except causal scale. According to the creators of this scale, short form IPQ has test-retest reliability and concurrent validity and its reliability of prediction is very good. The Persian version used on patients with diabetes and its reliability and validity reported desirable.

Mindfulness attention awareness (MASS): This scale consists of 15 single-factor[9]. Grading done positively and with six grade Likert scale (1 = almost always 6 = almost never). Ryan and Braun reported internal consistency of this scale in the academic example as 0.82. Abdi reported desirable the validity and reliability of this scale in his research by factor analysis and Cronbach's alpha.

Method of conducting the research: Selected patients divided into two experimental and control groups after the process of obtaining the necessary permits to carry out research from the security department of Imam Khomeini Hospital. The experimental group treated with mindfulness intervention in eight sessions designed according to the package.

Table 1: Summary of mindfulness-based therapy sessions

Sessions	The subject of sessions
1 & 2	**Tags reorienting:** Patients learn how recognize their intimate thoughts and actions and gain deep understanding of the problem, which the current feeling is communicational situation.
3 & 4	**Re-attribution:** Patients understand deeply that their thoughts or actions are not significant and they are wrong messages from the brain (caudate nucleus) and biochemical imbalance, which affect the communications.
5 & 6	**Re- focus:** Patients try to re-focus and pay attention on good behavior even for a few minutes (such as expressing feelings and intimacy).
7 & 8	**Revaluation:** Patients learn to rate thoughts and intruder desires, which cause unpleasant behaviors, lack of intimacy, and do not pay attention to their apparent authenticity.

FINDINGS

Descriptive information about understanding the disease and mindfulness presented in Table 2 and divided as pre-test and post-test in test and control groups.

Table 2: Descriptive information about emotional intelligence divided as comparison step in groups

Variable	Group	Step	Qty.	Average	Standard deviation
Perception of Disease	Test	Pretest	20	43.80	2.85
		Posttest	20	48.50	2.92
	Control	Pretest	20	43.30	2.36
		Posttest	20	44.00	2.97
Mindfulness Attention Awareness	Test	Pretest	20	33.85	2.53
		Posttest	20	39.25	2.21
	Control	Pretest	20	34.80	2.23
		Posttest	20	34.82	2.01

As seen, the average of test groups increase in post-test step. According to the results of table, mindfulness therapy in comparison with control group caused increasing mindfulness attention awareness and perception of disease in women with breast cancer.

For using parametric statistical methods, firstly, the assumptions of analysis of covariance independence of observations, normal distribution of the dependent variable, the homogeneity of variances, and homogeneity of regression slopes examined and approved in different groups.

Table 3: Analysis of multivariate covariance test

Statistical Index	Test	Value	F	df of hypothesis	df of error	sig
The difference between two groups with the effect of pre-test	Pillay effect	0.44	14.08	2	35	0.001
	Lambda Wilks	0.55	14.08	2	35	0.001
	Hotelling effect	0.81	14.08	2	35	0.001
	The biggest root	0.81	14.08	2	35	0.001

The results of table 2 showed that there was significant effect for factor of independent variable group after deleting the effect of pretest with multivariate covariance test. This effect show that at least, there is significant difference between one of the dependent variables of patients, who have been treated with the method of mindfulness and patients of the control group were significantly different (Lambda Wilks= 0.55, $p < 0.05$).

Table 4: One-way analysis of covariance in the analysis of multivariate covariance

Statistical Index	Source of change	SS	df	F	Significant level	Effect size	Test power
Perception of disease	group	57.38	1	8.25	0.007	0.19	0.85
Mindfulness attention awareness	group	60.83	1	9.74	0.004	0.21	0.95

DISCUSSION AND CONCLUSION

The purpose of present research was reviewing the efficacy of mindfulness therapy on mindfulness attention awareness and perception of disease in women with Breast Cancer. The results showed that training the mindfulness therapy affected the mindfulness attention awareness and perception of disease in women with Breast Cancer. Mindfulness therapy used frequently for patients. Kbat-Zeen (1990) recommended that in meditation and sitting for long periods without moving, focus on the sense of pain in the body and joints[18]. They just watching without moving and showing emotional reactions to these pains. He noted that the observer could decrease emotional response by pain. Therefore, the practice of mindfulness skills increase the ability of patients to tolerate negative emotional states and enable them to deal effectively. It seems that, this condition can increase the positive perception of disease and attention. In fact, continuous practice of mindfulness increases patient's awareness about their body, feelings, and thoughts. On the one hand, the reson of the effectiveness of mindfulness-based cognitive therapy in this study is that mindfulness therapy leads to cognitive change in the thinking and actions and profited from the conditional reinforcement principles. Thus, the patients see themselves in the above step for going to the next stage and this desire cause gradual recovery of patients. They continue individual treatment with calmness and awareness, and solve their problems in sessions. In addition, we can say that mindfulness makes adjustment of feelings without judgment and increase awareness of mental and physical feelings. It can help clearly seeing and acceptance of the emotions and physical phenomena as they occur. Therefore, it has important role in adjusted scores of mindfulness attention awareness. Mindfulness therapy help in adjusting negative behaviors and thoughts and lead to positive behaviors about health. In other words, we can say that mindfulness therapy increase attention and awareness of individuals about physical and mental feelings and cause confident in life, deep compassion, and acceptance of the real-life events. Because one of the most important aspect of mindfulness therapy is that patients learn to dealing with negative thoughts and emotions and experience mental events positively. According to Kabat- Zeen's view (1990), training the control of attention is for clear view, which act non-habit and noble. Total attention means that always we widely realize that who are we, what do we do, and why do we do it. In mindfulness therapy, patients exercise attention the body and breathing, and aware different senses of the body and even their breathing[18].

The results of this study is consistent with Belna's research (2008), which showed that promoting mindfulness is effective in reducing psychological distress associated with chronic diseases[19]. High awareness of patients with cancer related with low mood and symptoms of stress. During the training, the patients learn to clear their mind from any judgments that lead to decline positive understanding and deeply focus on present situation and use them in their own daily behaviors and activities. For increasing control of attention, individuals learn to do this exercise in their life frequently in the work they do until they reach situation, that they are fully aware of the time and place. This study had limitations. Perhaps the most important of them was long sessions of mindfulness-based cognitive therapy and hurried the students during the project and we should remind concepts and needed notes before the sessions. Another limitation was lack of sufficient literature on the effectiveness of mindfulness in patients with breast cancer and this study is the first research, which reviewed the efficacy of mindfulness therapy on mindfulness attention awareness and perception of disease in women with Breast Cancer in Iran. The lack of follow-up results of the research is another limitation. Therefore, by considering the benefits of mindfulness-based cognitive therapy compared to traditional psychotherapy, which prevent the return of symptoms, we recommended that in further research to assess the sustainability of results, take into account long-term follow-up results in a larger sample.

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The Evaluation of the Effectiveness of Couple-Therapy based on Ecological Model in Reducing Marital Conflicts

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ABSTRACT

The aim of this study was to evaluate the effectiveness of couple therapy based on the ecological model in reducing marital conflicts in couples referred to the Dispute Resolution Council and Welfare Intervention Centers in the province Markazi. The population of study were all couples who have been seeking to receive counseling regarding marital conflicts and the sample of study consisted of 30 couples (15 persons as the experimental group and 15 persons as the control group) who were divided randomly in two groups. Fallazadeh and Sanaee's (2012) questionnaire were used to measure couple conflict and reliability and stability of the questionnaire were confirmed. The results showed that couple-therapy by the use of the ecological model has a positive effect on marital conflicts, and consultants of consulting centers attempt to resolve couples' problems by the use of the ecological model.

Keywords: *Couple-therapy, ecological, tendency for divorce, family preservation.*

INTRODUCTION

Family is the bed of all social affairs and the origin of those who must circulate the life cycle of society with a healthy and dynamic mind [1]. Today, many marriages were failed shortly after their formation. Understanding why these marriages fail can be a solution to help couples who have marital conflicts [2]. Guttmann (1999) believes that "when marriage faces with conflict, it does not fail, but it fails when there is the lack of solution for conflict". Based on Guttmann's opinion, divorce is a process which begins with experiencing emotional crisis by both couple and finishes with trying to resolve conflict through entering to a new position with new roles and life cycles[3]. One of the ways to resolve marital conflicts is couple-therapy. A brief investigation of models and theories expressed in the field of couple-therapy represents this point that various factors, such as personal characteristics, social skills, attachment styles, and demographic and relational features cause tendency towards divorce[4].

The ecological models are important due to they assume that client-consultant relationship could not be perceived apart from different systems in which they live. As consultant has been influenced by these systems, clients, in turn, have also been effected by their own ecological systems [5]. The word "Ecosystem" refers to the set of interactions which is included in one's life and in different degrees ranged from biological features to a wider domain including socio-cultural contexts which affect human interactions [6]. Brofenbrenner has specified four systems which affect behavior; these are microsystem, which includes interpersonal relationships in an environment such as home and school; mesosystem, which includes the relationship among two or more

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subsystems together; exosystem, which includes the relationship between subsystems that are indirectly related to the person; and macro-system, which includes ideological elements of a society or an environment, such as believes and values [7]. A consultant who uses the ecological approach is a creative advisor who knows that all aspects of clients' lives should be considered and he/she should design his/her interventions by the use of the knowledge derived from this way. In the following, the steps of couple-therapy based on the ecological model are elaborated to resolve conflict between couples.

The steps of couple-therapy in the ecological model:

Step 1. Assessing and reaching a common definition;

Step 2. Goal-setting;

Step 3. Designing and implementing interventions;

Step 4. Making sustainable;

Step 5. Validation.

RESEARCH METHOD

Pretest-posttest plan was used with the control group to investigate the effectiveness of couple-therapy on couple conflicts. This plan is one of the most popular plans in the behavioral science research. This plan can be used to evaluate the effects of an independent variable on the dependent variable. In this plan, firstly, individuals are randomly divided into experimental and control groups. Then, the pre-test is performed with both groups. After the pre-test, the independent variable is implemented with the experimental group; but the control group does not receive the independent variable. After implementing the independent variable, both groups were taken the post-test. The population of the study consisted of all couples referred to the Welfare Counselling Centers in the province Markazi who demanded for counselling. Among these people, 15 persons as the members of the experimental group and 15 persons as the members of the control group who did not came to the counselling centers or who passed completely the process of couple-therapy were selected as the members of the control group. Fallahzadeh and Sanaee's (2012) questionnaire were used to measure marital conflicts. This questionnaire measures eight dimensions of conflicts, including reduced cooperation, reduced sexual relation, increased emotional reaction,

increased children's support, increased the individual relationship with his/her own relatives, reduced family relationship with friends and spouse's relatives, separating financial affairs, and reduced affective relation[8]. Chronbach's alpha for the entire questionnaire on a group of 270 people was obtained equal to 0.96 and for its eight subscales, it was: reduced cooperation (0.81), reduced sexual relation (0.61), increased emotional reaction (0.70), increased children's support (0.33), increased the individual relationship with his/her own relatives (0.86), reduced family relationship with friends and spouse's relatives (0.89), separating financial affairs (0.71), and reduced affective relation (0.69). Also, this questionnaire has a good reliability. In the stage of analyzing the test content, after preliminary implementation and calculation of correlation for each question with the entire questionnaire and its scales, due to the suitable correlation between questions, no questions were excluded. Bakhshipour et al. have obtained Cronbach's alpha equal to 0.90 and for the eight subscales, it was: reduced cooperation (0.79), reduced sexual relation (0.69), increased emotional reaction (0.72), increased children's support (0.56), increased the individual relationship with his/her own relatives (0.78), reduced family relationship with friends and spouse's relatives (0.80), separating financial affairs (0.70), and reduced affective relation (0.75). To gather data by the use of structured interviews with experts in the field of counselling, training model is developed based on the ecological approach. In the quantitative part of the research, also, first and at the beginning of starting the training course, the questionnaire for marital conflicts is performed for the both group of control and experimental, and then people participate in a 3-month training course that its content is based on the ecological approach. Also in the meantime, once at each 45 days, couples' situations are investigated through telephone interviews. In the end of the course, questionnaires are re-implemented for participants. Descriptive statistics methods, including mean, standard deviation, variance, etc., and inferential statistics methods, including covariance analysis, were used for the data obtained from the experiment implementation.

RESEARCH FINDINGS

Descriptive statistics related to research hypotheses in two groups of control and experimental is present in table 1.

Table 1: Descriptive statistics for the groups of control and experimental

Group		Experimental group				Control group			
Type	Number	Mean	Standard deviation	Min	Max	Mean	Standard deviation	Min	Max
Pretest	15	45.58	10.25	30	60	44.65	9.24	30	58
Posttest	15	50.50	8.54	32	61	84.45	8.5	31	61

The results of table 1 show that the mean of family conflict in the control group's pretest and posttest is equal to 45.58 and 44.65 respectively; and in the experimental group's posttest, it is equal to 50.50 and in its pretest, it is equal to 84.45. The covariance analysis test was used to investigate the research assumptions. Since one of the important assumptions of this analysis is the equity of variances in the groups, this issue was assessed by the use of Levine test, and the value of F was obtained equal to 0.59%, which was not significant at the level of 0.05, and this presents the equity of variances.

The results related to the covariance analysis are presented in table 2.

Table 2: The results of covariance analysis

Variable	Resource	Sum of squares	Freedom degree	Mean of squares	F	Significance level	Eta square
Family conflict	group	145.59	1	145.59	8.9	0.01	0.21

The results of table 2 imply that there is not a significant difference between the groups of control and experimental in the mean of the amount of family conflicts after performing couple-therapy by the use of the ecological method (F = 8.9, F = 6.48). It should be noted that the amount of effect of the group variable on family conflicts was 21% which shows that the independent variable, i.e. couple-therapy, has impact 21% on the reducing family conflicts.

DISCUSSION AND CONCLUSION

The researcher compared two groups of couples, that one of them have been training by the team and have received couple-therapy by the use of multidimensional ecological couple-therapy model and the other couple have received couple-therapy from other consultants, in terms of marital conflicts. According to the research plan, the covariance analysis method was used to analyze the difference between two groups. The pre-assumptions of the covariance analysis, including randomness, normality of data distribution, being independent, homogeneity of variances, and homogeneity of regression slope, were confirmed. The test result for marital conflicts test was significant at the confidence level of 99% ($p < 0.05$) ($F_{(1.24)}=12.14$, p=0.003, partial $\eta^2 = 0.176$). It is concluded that due to applying the independent variable,

no significant differences were observed between the amount two groups' conflicts (by balancing the effect of pretest). In fact, the sessions of couple-therapy based on the model of the present study have effected in reducing the tendency towards divorce. Given that the model of this study was ecological and special for this research, its results cannot precisely and completely compared to that of other researches, but since in the model of this study, training workshops with respect to qualitative analysis have been predicted for the consultants and couples, this part of research can be compared to the other previous researches. The results of this investigation was in line with a part of the results of Saeidi's et al. (2000)[9], Golamzadeh's et al. (1999)[10], Aghayousefi's et el. (2016)[11], Hosseini's et al. (2015)[12], and Etemadi's et al. (2014)[13] researches. Therefore, the results of this study showed that training the ecological couple-therapy has a significant effect on marital conflicts. In addition to creating a clear and practical perspective for consultants and psychotherapists, in particular family-therapists, the results of this study can be an effective guide for creating self-esteem, revealing and refining disparity in the way of couple's perceiving about each other, their communicational patterns, and human growth in total and its subsequent, reducing marital conflicts, increasing compatibility, and finally, reducing the tendency towards divorce. Also, in the expression that

the ecological couple-therapy can lead to the increased couple's compatibility, it can be said that couple-therapy with focus on couples' emotional relationship tries to resolve their problem; thus marital conflicts that are created based on couples' emotional problems, incorrect relationships, and their unsafe attachment to each other can be resolved by the ecological couple-therapy. These findings state that couples tend more to show vulnerable and negative relationships, such as criticism, humiliation, blame, and angry and when their spouses try to resolve a problem, they express the lowest level of empathy. This kind of negative relationships reduce the use of positive problem-solving skill, such as encouragement and open discussion. Therefore, by resolving couples' emotional problems, identifying unexpressed emotions, and the identification of emotional needs of spouse, the ecological couple-therapy can improve couples' interactions and subsequently increase the extent of love expression in couples. However, in the approach of this study, with respect to the knowledge of these roots, consultants of the intervention centers have been given these trainings in the crisis; and finally, these consultants conveyed these trainings and techniques to couples. The ecological couple-therapies with relying on the proper release of emotions, establishing couples' attachment style, and reducing couples' emotional and anxiety problems increase couples' physical health. In the couple-therapy, people learn to understand their spouses' emotions and feelings and speak to them about their own positive and negative emotions and feelings and be a good listener to their spouses. The modification of these seemingly simple cases is a very important step in couples' mutual understanding of each other and improving their relationship and marital compatibility, and with regard to social support and relationship, it is a very important factor in couples' spirit and psychological, physical, and mental health. In fact, the results from the scale conflicts express that each expert has a special vision towards conflict; however, in general, the concepts on incompatibility, disagreement, fight, and confrontation are considered the most basic factors forming conflict. This disagreement can occur in terms of understandings, tendencies, behaviors, emotions, and needs. In the case of conflict, there are to visions and each of them addresses one aspect: the traditional vision which is a dominant theory, considers conflict as a cause of loss, destruction, and crisis and focuses on its destructing implications, thus the orientation of this view is a rapid solution and treatment for conflict. On the other hand, the view of interaction considers conceptual differences, different opinions, and disagreement in decisions as leading to growth, conflict resolution, and dynamism and mobility. The results about this question can be attributed to training the way of problem-solving, because by investigating the problems, couples can resolve them effectively; this issue in the model has been considered in the section of training to consultants and designing training courses. In relation to the other factor of tendency towards divorce in the discussion of the trained sessions, sufficient explanations have been provided about the relationship, and since couples have obtained more information about relationship and effective communication style, in future they can work about their relationship more effectively.

All studies face with some limitations. Since this study has been conducting in Delijan and its nearby towns and within the province Markazi, caution should be taken in generalizing the results to other cities and surrounding areas. Another restriction is availability of study sample that current generalizations must be performed with caution. It is suggested that the effectiveness of this approach should be compared with the other approach in this context; the issue that was not possible in this study. Also, it is suggested that consultants and family-therapists utilize this short-time therapeutic approach in couple-therapy and family-therapy groups and family-training classes in order to resolve marital conflicts.

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Patient Satisfaction with Opioid Substitution Therapy Using Buprenorphine at a Tertiary Care Centre

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ABSTRACT

Background: In deaddiction treatment, patient satisfaction is linked with favourable outcomes and greater treatment retention. Aim of this study was to determine (a)patients' satisfaction with OST, (b)correlation between satisfaction scores and patient characteristics, and (c)patients' expectations from OST and care providers.

Method: Eighty two patients coming regularly to OST centre for atleast one month prior to study initiation were included in this study. Their demographic characteristics, history of drug dependence and previous deaddiction treatment was recorded. Participants' satisfaction with treatment was evaluated using Client Satisfaction Questionnaire. Scores for individual item were added for each participant. Participants were also given the option to make any comments or suggestions. CSS was correlated with patient characteristics by statistical analysis using Chi square test. Open ended qualitative responses were categorised into positive and negative comments to understand patients' expectations.

Results: Mean client satisfaction score was 29.17 ± 2.943. CSS was positively skewed with 46 (56.1%) participants being "highly satisfied" and remaining 36 (43.9%) participants being "satisfied" with OST. There was no significant correlation between patient characteristics and satisfaction scores, but few important trends were noted. Most patients gave positive feedback in the open ended qualitative response section.

Conclusion: Participants reported high level of satisfaction with OST. Open ended questions and suggestions were helpful in understanding participants' expectation from treatment and staff.

Keywords: opioid substitution therapy, deaddiction, patient satisfaction, patient expectation

INTRODUCTION

According to the World Drug Report (2010), there are 871,000 heroin and 674,000 opium users in India.[1] Opioid substitution therapy (OST) has been recommended as the most effective and first-line treatment option for long-term pharmacotherapy of opioid dependence.[2] Under the National AIDS Control Programme, buprenorphine is the most commonly used drug for it in India. Currently, there are 213 OST centres in the country supported by Department of AIDS Control.

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A multi-site study has shown that retention rates on OST were about 70% at the end of 9 months.[3] However, this may decline over time in OST.[4] To improve retention rates, patients' treatment needs, expectations, and overall satisfaction should be assessed.[5] Assessment of patient's satisfaction with received treatment can be used as a measure of quality of care and perceived benefits of a service. Satisfaction, however, is influenced by multiple factors such as demographic characteristics, beliefs, previous treatment experiences, and expectations of the patients; nature of illness being treated; treatment method used, and behaviour of the treatment provider.[5] In deaddiction treatment, patient satisfaction has been linked with favourable outcomes, such as higher service use, reduced substance abuse, better physical and mental health, psychosocial improvements, and greater retention in treatment.[6-9]

Satisfaction has primarily been measured quantitatively using questionnaires yielding high satisfaction scores.[5,10,11] But these questionnaires may not throw adequate light on patients' perspective of the treatment. Moreover, WHO recognizes psychosocial support as an essential element of effective OST.[12] Hence the relationship of the patient with the staff involved in OST, organisation and delivery of treatment, and any other expectation regarding psychosocial support becomes equally important.

Despite of growing emphasis on the importance of patient's perspectives, drug abusers' perspectives are seldom given importance in setting goals and evaluating treatment. There has been no previous study in literature relating patient satisfaction with OST in India. Therefore, this study aimed at assessing (a) participants' satisfaction with treatment received in OST centre, (b) whether the satisfaction scores vary with patient characteristics, and (c) any other expectations which the patient has from treatment or staff.

METHOD

Study design: This study was conducted in the OST centre at MLN Medical College, Allahabad, Uttar Pradesh. 200 intravenous drug abusers are registered in the OST centre. Out of these, patients coming regularly to the OST centre for atleast one month prior to study initiation and gave written informed consent for participation were included in the study. Patients who were irregular or did not give consent for the study were excluded. Hence, a total of 82 patients were included in the study. Their demographic characteristics were recorded. Their drug dependence and treatment history was also recorded. Participants' satisfaction with treatment was evaluated using Client Satisfaction Questionnaire (CSQ-8).[13] CSQ-8 assessed patient's satisfaction on a 4-point Likert type scale. CSQ-8 was originally developed in *English*. It was translated to *Hindi* for easy patient administration. It has 8 questions, each with a scoring range of 1 to 4. It was scored by summing the individual item scores to produce a range of 8 to 32, with higher scores indicating greater satisfaction. At the end of the questionnaire, participants had the option to make comments and suggestions about the staff of the centre, availability of medicine, dosage, timings of centre, psychological support, any other physical or psychological problems they have, or any other suggestion they wish to make.

Analysis: Quantitative data: For statistical analysis, client satisfaction scores (CSS) of participants were divided into 3 levels of satisfaction: 1) dissatisfied or least satisfied (8-16); 2) satisfied (17-29); and, 3) highly satisfied (30-32). Satisfaction scores were then co-related with patient characteristics. Data was statistically analyzed using Chi square test (SPSS version 20.0) and p value < 0.05 was considered statistically significant.

Qualitative data: All the open ended qualitative responses were read and a list of basic themes of given comments and suggestions was formed. By categorizing all the common comments together, a list of 10 categories was formed. These included positive and negative comments about staff behaviour, availability of medicine, dosage, timing of the OST centre, waiting rooms, toilets, CCTV cameras, addressal of other physical/psychological problems, additional services like HIV/AIDS and DOTS clinics within OST centre, and rehabilitation services.

RESULTS

Out of the 82 study participants, there were 81 males and only 1 female participant. Their age was in the range of 21 – 48 years. Table 1 summarizes the descriptive characteristics of study participants.

Mean CSS of study participants was 29.17 ± 2.943. CSS was positively skewed with 46(56.1%) participants being "highly satisfied" and remaining 36(43.9%) participants being "satisfied" with OST. No participant reported to be "dissatisfied" or "least satisfied".

Table 2 shows correlation of sample characteristics with client satisfaction. Overall client satisfaction was not statistically related to any sample characteristic but a few important trends were noticed. In the age group 21-30 years and 31-40 years, 59.37% and 60% participants, respectively, were "highly satisfied" with OST. Whereas only 40% participants in the age group 41-50 years were "highly satisfied" with OST (p value = 0.380). When educational status was correlated, 61.29% of those educated less than high school level and 60% of uneducated subjects were "highly satisfied" while among subjects with education upto or more than high school level, 50% were "highly satisfied" and 50% were "satisfied". 68.96% unmarried subjects were "highly satisfied" with OST as compared to only 49.06% married subjects. More participants amongst those with longer history of drug dependence were "highly satisfied" with OST. 66.67% subjects with more than 10 years of drug dependence history were "highly satisfied" with OST while only 52.46% subjects with drug dependence history of less than 10 years were "highly satisfied".

Satisfaction scores were higher for those who had previously attempted quitting intravenous drug (59.67% were "highly satisfied") as compared to those who have not (45% were "highly satisfied"). Co-relating duration of therapy at OST centre with CSS, longer duration of maintenance therapy showed higher satisfaction. Amongst subjects coming to OST centre for less than 1 year, only 41.17% were "highly satisfied" and 58.82% were "satisfied" with treatment. Whereas, in subjects coming to OST centre for more than 1 year, 60% were "highly satisfied" with treatment.

All 82 patients gave positive or negative comments and suggestions.(Table 3) All patients reported the behaviour of staff at OST centre as 'good' or 'very good'. All patients said that there was easy availability of the medicine. All patients were satisfied with the dosage. 7 patients (8.54%) suggested that patients should be allowed to take medicine outside OST centre.

96.34% patients (n=79) said that their other physical/psychological problems were taken care of at the centre. 80.5% participants (n=66) were satisfied with the timings of the centre. 14 patients (17.07%) commented that centre should open earlier in the morning, 1 patient suggested that timings should be extended till the evening, and 1 participant suggested that centre should function for full working hours even on public holidays. 72 participants (87.80%) wanted that other services like HIV/STD and DOTS clinic should function within OST centre. 56 patients (68.29%) suggested that there should be a separate waiting room for OST patients for a more interactive treatment. 3 participants suggested that CCTV cameras should be installed within OST centre, 1 participant said that toilets should be present in the OST clinic and 1 participant suggested that hospital and government should make provision for rehabilitation and employment of those OST patients who need it.

Table 1: Description of demographic characteristics and treatment history of study participants

(a)	Demographic description			
		Number (%) or Mean + SD		
	Age (years)	33.11+7.001		
	Gender	Male: 81(98.8)	Female: 1(1.2)	
	Education	>High school: 36(43.9)	<High school: 31(37.8)	Uneducated: 15(18.3)
	Marital status	Unmarried: 29(35.4)	Married: 53(64.6)	
	Residence	Rural: 10(12.2)	Urban: 72(87.8)	
	Monthly income	>Rs.10,000: 24(25.3)	<Rs.10,000: 53(64.6)	Unemployed: 5(6.1)
	Years of drug dependence	7.51+5.375		
(b)	Drug treatment history			
	Previously attempted quitting	Yes: 62(75.6)	No: 20(24.4)	
	Previous hospitalization for deaddiction	Yes: 38(46.3)	No: 44(53.7)	
	Duration of OST (in months)	33.89+16.805		

Table 2: Correlation of sample characteristics with client satisfaction

S. No.	Sample characteristics		No. Of "Satisfied" clients(%)	No. Of "Highly satisfied" clients(%)	Total	p value
1.	Age	21-30 years	13(40.6)	19(59.37)	32	0.380
		31-40 years	14(40)	21(60)	35	
		41-50 years	9(60)	6(40)	15	
2.	Gender	Male	36(44.44)	45(55.56)	81	-
		Female	0	1(100)	1	
3.	Education	≥High school	18(50)	18(50)	36	0.614
		<High school	12(38.71)	19(61.29)	31	
		Uneducated	6(40)	9(60)	15	

Conted…

4.	Marital status	Unmarried	9(31.03)	20(68.96)	29	0.082
		Married	27(50.9)	26(49.06)	53	
5.	Residence	Rural	4(40)	6(60)	10	0.791
		Urban	32(44.44)	40(55.56)	72	
6.	Monthly income	≥Rs.10,000	20(37.73)	33(62.26)	53	0.237
		<Rs.10,000	14(58.33)	10(41.67)	24	
		Unemployed	2(40)	3(60)	5	
7.	Drug dependence	0-5 years	20(45.45)	24(54.54)	44	0.459
		>5&≤10 years	9(52.94)	8(47.06)	17	
		>10 years	7(33.33)	14(66.67)	21	
8.	Previous attempt of quitting	Yes	25(40.32)	37(59.67)	62	0.250
		No	11(55)	9(45)	20	
9.	Previous hospitalization for deaddiction	Yes	16(42.10)	22(57.89)	38	0.761
		No	20(45.45)	24(54.54)	44	
10.	Drug maintenance therapy at OST centre	≤1 year	10(58.82)	7(41.17)	17	0.161
		>1&≤3 years	9(31.03)	20(68.96)	29	
		>3 years	17(47.22)	19(52.78)	36	

Table 3: Categories of comments and suggestions by participants

S. No.	Comments	Positive n (%)	Negative n (%)
1.	Behaviour of staff at OST centre	82(100)	0(0)
2.	Easy availability of Medicine	82(100)	0(0)
3.	Dose and method of drug dispensing	75(91.46)	7(8.54)
4.	Addressal of other physical/psychological problems	79(96.34)	3(3.66)
5.	Timing of OST centre	66(80.5)	16(19.5)
6.	Request for additional services like HIV/STD, DOTS within OST centre	72(87.80)	10(12.20)
7.	Request for separate waiting room	56(68.29)	26(31.71)

DISCUSSION

All participants were either "highly satisfied" or "satisfied" with OST. Previous studies have also reported positively skewed results when patients' satisfaction was assessed.[5,7,11] In a meta-analysis, it was suggested that this might be due to lack of clear norms for comparing treatments, psychometric properties of instruments used, and lack of a specific theoretical framework for patient satisfaction.[14] It is also believed that an ill person will most likely be grateful to the caregiver, resulting in positive skewness in satisfaction scores.[5]

In this study, higher satisfaction was seen in the age group 21-40 years where 60% subjects were "highly satisfied" as compared to older patients in whom 40% patients were "highly satisfied", although this result was not statistically significant. This is in contrast to previous studies where older patients were more satisfied with treatment.[5,10] We believe that younger patients are better able to appreciate the improvement in quality of their social, professional and personal life with treatment, hence higher satisfaction was reported. Association of gender with treatment satisfaction was not feasible in this study due to just one female participant. Less educated and uneducated participants had higher satisfaction levels as compared to more educated subjects, although this difference is statistically insignificant. Lack of knowledge about what to expect from the treatment and

gratitude of patients towards the caregiver may be the reason for higher satisfaction levels.

According to a meta-analysis[14] more chronic problems show lower satisfaction levels but in our study, patients with longer history of drug dependence (>10 years) showed higher satisfaction levels, though the result was not statistically significant. We believe that subjects with longer duration of drug abuse are better able to appreciate the improvement in their health and social life after OST. Similarly we believe that patients who have previously attempted quitting intravenous drugs and experienced withdrawl symptoms, are more capable of assessing improvement in their condition. Hence such subjects showed higher satisfaction levels. Higher satisfaction has shown longer retention in deaddiction treatment.[9] Vice versa, we found that subjects with longer duration of maintenance therapy at OST centre (>1 year) showed higher satisfaction levels.

CSQ-8 is formulated using ratings from mental health professionals.[13] Patients' perspective and expectations from treatment are not fully understood using CSQ-8 therefore the section with comments and suggestions was necessary. Psychological support received by the patient plays an important role in effective treatment.[12] All participants were satisfied with staff behaviour, availability of medicine, dose and delivery of medicine. However, about 8.5% patients suggested that they should be permitted to take medicine home, in case they are ill, going out of station or cannot come to centre daily due to valid reasons. But buprenorphine tablets have abuse potential. Also, among drug users, buprenorphine is often the preferred opioid used for injecting in India. As sublingual buprenorphine easily dissolves in water, it can be easily abused for injection purposes. Hence buprenorphine is dispensed as Directly Observed Treatment.[3] This is also the reason why toilets are not made in the OST clinic.

Most of the participants were satisfied with the psychological support provided by the OST staff. Most of the participants were also satisfied with the timings of OST centre. Few participants suggested longer working hours so that their jobs don't suffer. Most of these patients were daily wagers like plumber, electrician, driver. 88% participants suggested additional services like HIV/AIDS and DOTS clinic should function alongwith OST clinic. This is a considerable issue as drug abusers are a high risk population for HIV/STDs and TB. About 68% participants favoured a separate waiting room for the OST patients, while others said that it could lead to chaos and unruly behaviour among patients. Another considerable issue suggested by one of the participants was rehabilitation and employment opportunities of such patients. These patients are not easily trusted upon with respectable jobs. Rehabilitation will have a positive psychological effect and improve treatment outcome.

Limited sample size could have resulted in statistically insignificant correlation between patient characteristics and satisfaction scores. All the participants were intravenous drug abusers. Hence the results could not be extrapolated for oral or inhalational drug abusers. Even with these limitations, this is the first study conducted in India which assesses patients' satisfaction with OST. It can be used as a pilot study for further research in this area. Within the limitations of this study, it is concluded that OST shows high patient satisfaction levels. Patient reported outcomes are an important source of information to guide treatment modalities and welfare schemes. By addressing these treatment barriers, patients' adherence to OST and beneficial outcomes can be improved.

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Validity and Reliability of Montreal Cognitive Assessment and Its Comparison with the Translated Hindi Mental Status Examination in a South Indian Geriatric Population

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ABSTRACT

Introduction: Ever since the MMSE has been brought under exclusive copyright, there has been a search for an alternative test for routine bedside cognition testing. The Montreal Cognitive Assessment scale has been validated in several previous studies for its effectiveness in cognition testing. However its use in India has not yet been validated. In this study we have tested the Validity and Reliability of MoCA in assessing neurocognitive function among the geriatric population attending a tertiary care hospital in south India in comparison with the Hindi Mental State Examination (HMSE).

Methods: A cross sectional study was conducted over a period of two months during which 109 elderly patients aged > 60 years attending a health care centre were enrolled in the study. They were in turn administered the HMSE and MoCA and the results were compared. The data was analyzed using SPSS 17.0. Validity and reliability of MoCA among Indian elderly was assessed.

Results: A total of 109 patients were analysed with a mean(SD) age of 68.9(6.759) years.In comparison to HMSE MoCA had a good internal consistency with a Cronbach's Alpha of 0.715.The area under the curve was 0.761 for MoCA (95%CI 0.672-0.849) with a sensitivity of 97.8% and a specificity of 67.2 % at a cut off of 26. There was a good positive correlation of MoCA with HMSE at r=0.757.

Conclusion: Montreal Cognitive Assessment is a reliable and valid tool in routine screening for neurocognitive function among the English and Kannada speaking South Indian elderly.

Keywords: neurocognitive , cognition, validity, reliability.

INTRODUCTION

Since the year 1975, with the development of the Mini Mental Status Examination (MMSE) by Folstein, the use of MMSE had become synonymous with bedside cognition testing. However MMSE scores have shown bias in patients with low education, and in those with language and cultural barriers.[1]The ability of MMSE to test frontal executive and visuospatial function has been poor.[2]These limitations have prompted the development of several new tests of cognition which have sensitivities and specificities comparable to the MMSE, such as the Mini Cog Test, the Addenbrooke's Cognitive Examination –III, and the Montreal Cognitive Assessment (MoCA)[3, 6] Neuropsychological testing methods carried out by trained neuropsychologists are available but these take 1-3 hours and are beyond the scope of standard geriatric care.[3] Less time consuming methods (typically taking <5mins) like Abbreviated Mental Test (AMT), Six-Item Screener (SIS), Clock Drawing Test (CDT), Mini-Cog etc. are available but found to be unreliable in varied settings.[4]

Despite its limitations MMSE was widely used in most studies of cognition and has become ubiquitous with bedside cognition testing.

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However in the year 2001, the MMSE was brought under exclusive copyright license to Psychological Assessment Resources, which controls copying, distribution and use of MMSE for clinical and research purposes and needs to be purchased for each administration[6]. This change has prompted us to look for alternatives to the MMSE for rapid bedside assessment for neurocognitive disorders in routine geriatric practice.

The MoCA is considered to be more sensitive than the other cognitive screening tests and studies have confirmed its effectiveness in distinguishing between normal subjects and those with or mild Alzheimer's.[5] The MoCA has also been found to be very effective in detection of mild cognitive impairment.[7] Many organizations around the world have translated and adapted it to suit linguistic and educational variations. India being a country with diversity in language and education standards, these differences play an important role in the assessment of cognitive impairment when internationally valid scales are used which cater largely to English speaking Western populations. In the year 1995, Ganguli et al[8] have developed a translated version of the MMSE and adapted it to the rural illiterate elderly population of India. We have selected the Hindi Mental State Examination as the comparison scale to test the MoCA. In this study we have tested the Validity and Reliability of MoCA in assessing neurocognitive function among the Geriatric population attending a tertiary care hospital in South India in comparison with the HMSE.[8]

METHODOLOGY

Study Area: The study was carried out in a 600 bedded multi-speciality tertiary care hospital in Mangaluru,South India.

Study Duration: The study was carried out for a period of two months.

Study Design: A cross-sectional study was conducted to fulfil the study objectives.

Study Population: The elderly individuals (those aged ≥ 60 years) seeking health care at the tertiary care hospital constituted the study population

Inclusion criteria: Those aged ≥ 60 years attending the tertiary care hospital and agreeing to participate in the study on a voluntary basis were included.

Exclusion Criteria: Elderly individuals who had any of the following conditions were excluded from the study:

1. Acute illness

2. Serious systemic illness such as end stage renal disease, congestive cardiac failure, end stage liver disease and Chronic Obstructive Pulmonary Disease on oxygen therapy

3. Acute or chronic Psychiatric illness

4. Delirium

5. Severe depression

6. Hearing impaired

7. Poor vision

8. Any physical handicap including aphasia, stroke which limited their ability to complete the cognitive test.

9. Poorly controlled metabolic diseases such as diabetes , hyponatremia ,uremia, hypothyroidism

Sample Size: The sample size was estimated by using the formula,

$$N=Z^2 S_n (1-S_n)/L^2 p$$

where Z=1.96, taking 95% confidence interval, S_n is sensitivity which equals 87 %,

[8]L is the allowable error set at 20 %(power taken as 80%), while p is the prevalence taken as 50%. Using the above mentioned formula which considers 95% confidence limits, the sample size was estimated to be 110.

Sampling Method: The study participants were selected by a process of convenient sampling.

Data Collection: After obtaining Ethics Committee approval study was conducted at various settings**.** Written informed consent was taken from all the participants.

After recording baseline demographic data (age, gender, education, comorbidities) and conducting a brief Comprehensive Geriatric Assessment for the exclusion criteria, HMSE English version or Kannada version was administered to the participants. All patients were screened for concurrent depression using Geriatric Depression Scale[9] HMSE was first administered to the study participant following which, after a minimum

gap of 30 minutes in order to avoid mental fatigue, the MOCA English or Kannada version was administered. The scores thus obtained and the time taken for administration of HMSE and MOCA was recorded.

Study Tools: A pre-designed, pre-tested and validated proforma was used to collect the information. The English and Kannada versions of MoCA as well as the English and Kannada translations of HMSE were used.

Study Analysis: The data was analyzed using SPSS 17.0. Validity and reliability of MoCA among Indian elderly was assessed. Internal consistency was assessed using Cronbach's Alpha. Sensitivity, specificity and ROC curve analysis for the MoCA was also done. Statistical significance was set at 0.05% level of significance ($p < 0.05$)

OBSERVATIONS AND RESULTS

In our study, a total of 109 patients were analysed . The mean age of the sample was 68.39(SD=6.759) years . Males constituted the majority of the samples at 71(65.1%) and females were =38 (34.9%). The other demographic characteristics of the study group is as follows: (Table 1)

Table 1: Basic demographic details

Mean age in years (SD)	68.9(6.759)
Sex	Males = 71(65.1%)
	Females = 38(34.9%)
Mean years of Education(SD)	8.17(4.946)
MoCA score –Mean(SD)	23.08(5.257)
HMSE score – Mean (SD)	27.98(2.498)
Language	English =31(28.4%)
	Kannada= 78(71.6%)

There was no significant difference between normal and impaired group due to gender. (Chi^2=2.267, p=0.132). Those with normal scores on MoCA had a higher mean years of education[10.76(SD=4.528)] than those who were cognitively impaired [6.36yrs(SD=4.416)]; p<0.001.

The Cronbach's alpha value of 0.715 indicates a good internal consistency for MoCA, while the internal consistency of HMSE in this sample was 0.549. There was a positive correlation between MoCA and HMSE; with r = 0.757(p=0.000).

Table 2: Item deletion Cronbach's Alpha

	Cronbach's alpha if item removed
Visuospatial/Executive	0.667
Naming	0.705
Attention	0.645
Language	0.674
Abstraction	0.706
Delayed Recall	0.717
Orientation	0.680
Memory	0.692

The Cronbach's alpha after removal of each item suggests improvement on removal of delayed recall, abstraction and naming. The area under the ROC curve is 0.761 for MoCA (95%CI 0.672-0.849). It has a sensitivity of 97.8% and a specificity of 67.2 % at a cut off of 26.
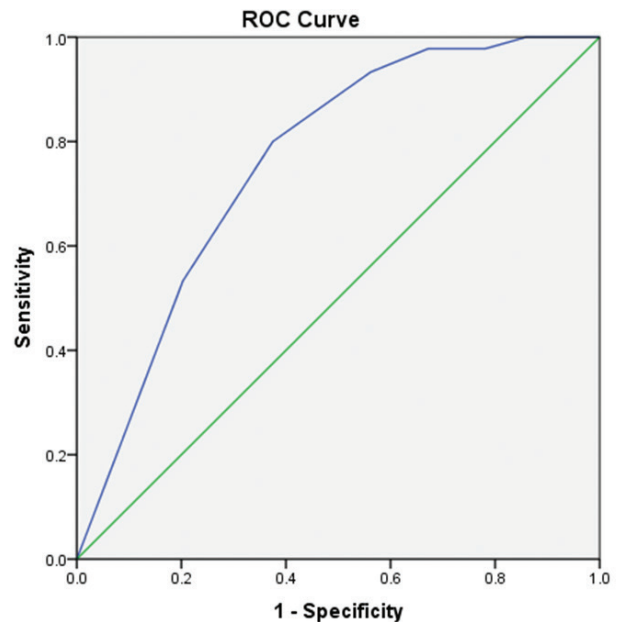
Diagonal segments are produced by ties.

DISCUSSION

Our study was conducted to assess the validity and reliability of MoCA in assessing the neurocognitive function among elderly patients attending a tertiary care hospital in South India. The Cronbach's alpha for MoCA in our study was good at 0.715, suggesting a good reliability for MoCA among our elderly population.The internal consistency of the comparison scale which we

used was much lower at 0.549 for the HMSE. This may be due to the fact that HMSE uses fewer items (only 6), and thereby reflects its ability to measure more broadly the components of cognition, whereas the MoCA uses 8 items. On testing the internal consistency after removal of each item, the Cronbach's alpha improves on removal of the delayed recall, abstraction task and naming. This suggest that these items may need to be reviewed in the cultural context, and may need to be replaced with more suitable tasks. Many of the study participants found it difficult to recall most of the words in the delayed recall segment probably suggesting a lack of familiarity with the words. Thus 'delayed recall' is a poor contributor to the assessment of cognition as indicated by the higher Cronbach's alpha on its removal. During the abstraction test we noticed that majority of the elderly did not understand the task .As we have seen in the HMSE, a probable cue[8] or use of more than a single example or a more difficult example may help to solve this. Difficulty was also seen among participants in completing the naming task, specifically in naming the rhinoceros, indicating a lack of familiarity with the animal rather than a deficit in naming, thus leading to poor performance in this section. Replacing the rhinoceros with a local and more familiar animal would give a better score in this section.

Those with higher mean years of schooling scored significantly better on MoCA scores suggesting the well-known protective effect of improved cognitive reserve on neurocognitive function. The mean number of years of education in our study sample was 8.17 years, with 9% of them being illiterate. The low educational status may have resulted in the high false positive rate in our study. There was no effect of gender on cognitive function in our study population.There was a good positive correlation of MoCA with HMSE at r=0.757. The area under the ROC curve was fairly good at 0.761 for MoCA, which was comparable to the statistics observed in similar studies namely 0.79 in one study[2] comparing MoCA and MMSE in detection of mild cognitive impairment and dementia among patients with Parkinson's disease and 0.77 in another study for detecting mild neurocognitive disorder.[23] In our study MoCA had a very good sensitivity of 97%. However the specificity was low at 67%, due to which there was high chance of misclassification of normal elderly as neurocognitively impaired. Another similar study conducted for detecting mild cognitive impairment and dementia among a Chinese population gave a sensitivity of 88% and and specificity 70% at cut-off score of 27 for detecting mild cognitive impairment.

[20] Many other studies also pointed towards a better sensitivity of MoCA in comparison to MMSE like 97% for MoCA and 65% for MMSE in one study[21] and 92.3% sensitivity for MoCA in yet another study.[19] The low specificity of MoCA and improvement in Cronbach's alpha on removal of certain items suggests that the items delayed recall, naming and abstraction require review and probable change. We suggest that the items delayed recall, naming and abstraction be reviewed and retested in a similar South Indian population in a larger study. Delayed Recall may be improved by adding a cue as is done in the HMSE.[8] We also suggest that since the word rhinoceros presented maximum difficulty in naming, it could be replaced with Elephant or Owl or Rabbit as has been done in similar studies[11, 18] from the South East Asian Countries as these countries have culturally similar populations.

Conclusion: The Montreal Cognitive Assessment is a reliable and valid tool in routine screening for neurocognitive function among South Indian elderly. After initial screening they may then need to be subjected to further detailed assessment for confirmation of diagnosis of neurocognitive dysfunction owing to the low specificity.

Conflict of Interest: None

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The Prevalence of Obesity in Adolescent Age Group of District Hapur U.P. India

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ABSTRACT

Objective: The objective of this study was to know the prevalence of overweight and obesity in adolescent of western U.P.

Setting: Tertiary care center of Saraswathi Institute of Medical Sciences Hapur

Design: Cross sectional prospective study

Material and Method: This study was conducted at department of Community Medicine and Pediatrics of Saraswathi Institute of Medical Sciences Hapur between May 2015 – April 2016. A total of 505 Adolescent were included in this study. All Anthropometric measurements were taken and compared with WHO growth reference charts.

Results: A total 505 Adolescent were there out of which 255(50.5%) were from rural area and 250(49.5%) were from urban area. The males and females were 258(51%) and 247(49%) respectively. The overall prevalence of obesity was 36(7.1%) as per WHO growth chart. The prevalence of obesity in urban male was higher in early adolescence was 17%, . The prevalence in the same order for urban female was 10.6%, 6% and 6.6%. For rural males and females the prevalence in early, mid and late adolescence was 8.9%, 4.8% and 3.3% and 3.9%, 2.3% and 6.2% respectively. According to the age, the prevalence of obesity for early, mid and late adolescent group was 16%, 4.9% and 6.4% respectively. The prevalence was 5% and 9.2% respectively for rural and urban area respectively.

Conclusion: The increasing prevalence of overweight and obesity in childhood and Adolescent will likely have profound implications for future rates of CVD, type 2 DM, mortality and morbidity.

Keywords: *Obesity, Overweight, Type 2 DM, Cardiovascular diseases*

INTRODUCTION

The term Adolescent is derived from Latin word "adolescence" meaning "to grow", or "to mature". The WHO defines adolescent as an individual in the age group of 10-19 years[1]. Adolescence comprises 10 years of life of an individual and is associated with physical changes and psycho –social stress[2].It also represents one of the critical transmissions in the life span and is characterized by a tremendous pace in growth and changes that is second only to that of infancy[3]. Adolescent population comprises a significant cohort of world population forming 18 percent of world population[4]. India has the largest population of adolescents (243 millions) in the world. According to 2011 census data, adolescents comprise nearly 22% of India's total population. Out of which 12% belong to the age group of 10-14 years and nearly 10% are in age group of 15-19 years [5]. Adolescence is an important time for laying the foundations of good health in adulthood. Many healths – related behaviors and conditions that related to major non communicable diseases start or are re-in

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forced during this period of life[6]. Adolescent group has high nutritional requirement pertaining to rapid physical growth spurt and under nutrition has traditionally been the focus of nutrition agendas in low and middle income countries. Although under nutrition still constitute a major burden of health issue among the low income countries, in last few decades the economic growth, urbanization demographic changes and globalization has change the nutritional landscape globally. Global trends indicate decrease in diseases of under nutrition, while over nutrition is increasing. This co - existence of under and over nutrition, a phenomenon known as the "Dual burden" poses a novel public health challenge[7]. Obesity in long run is associated with multiple chronic and co-morbid conditions such as type 2 D.M, Hypertension, polycystic ovarian disease, dyslipidemia and associated with increased mortality and morbidity[8].

MATERIAL AND METHOD

This study was conducted at Department of Community Medicine and Pediatrics of Saraswathi Institute of Medical Sciences Hapur between May 2015 – April 2016. The subjects in this study were selected by multistage random sampling technique from four schools, two schools from urban area Hapur and two schools from rural area Pilkhuwa. The inclusion criteria in this study were age between 10-19 year. The written consent was taken from parents and school Authorities. Clearance from ethical committee was also taken. All the anthropometric measurements were taken by using appropriate instruments. BMI was calculated for each study participant and compared against WHO growth reference charts. According to WHO cut-off the participants categorize as under nutrition < - 2 SD, overweight > + 1 SD and obese > + 2 SD.

RESULTS

Table 1: Socio demographic profile

Variables	No.	%
age		
10 - 13 Years	195	38.7
14 -16 years	162	32
17 -1 9 years	148	29.3
Gender		
Male	258	51
Female	247	49
Religion		
Hindu	396	78.5
Muslim	109	21.5
Residence		
Rural	255	50.5
Urban	250	49.5
Housing Status		
Kuccha/SemiPucca	114	50.5
Pucca	391	49.5
Family type		
Nuclear	131	22.5
Joint	374	77.5
Family Size		
< 5	89	17.6
5-Jul	157	31
> 7	259	51.2
Dietry habits		
Veg		
Male	144	55.8
Female	155	62.8
Non-veg		
Male	114	44.2
Female	92	37.2

Table 2: Distribution of study participants by age, gender and residences

Gender/Age	Rural		Urban		Total	
Male	No	%	No	%	n	%
10 - 13 year	56	11	41	8.1	97	19.2
14 -16 year	41	8.1	49	9.7	90	17.8
17 - 19 year	33	6.5	38	7..5	71	14.1
Female						
10 -13 year	51	10	47	9.3	98	19.4
14 -16 year	42	8.3	30	5.9	72	14.3
17 -19 year	32	6.3	45	8.9	77	15.2
Total	255	50.5	250	49.9	505	100

Table 3: Prevalence of overweight according to residence, age and gender

Gender/Age	Rural			Urban			Urban + Rural		
Male	No	%	Group Total	No	%	Total	n	%	Total
10 - 13 year	6	10.7	56	9	21.9	41	15	15.5	97
14 -16 year	2	4.8	41	3	6.1	49	5	5.6	90
17 - 19 year	1	3	33	4	10.5	38	5	7	71
Female									
10 -13 year	2	3.9	51	8	17	47	10	10.2	98
14 -16 year	2	4.7	42	3	10	30	5	6.9	72
17 -19 year	2	6.2	32	3	6.6	45	5	6.4	77
Total	15	5.9	255	30	12.1	250	45	8.9	505

Table 4: Prevalence of obesity according to residence, age and gender

Gender/Age	Rural			Urban			Urban + Rural		
Male	No	%	Group Total	No	%	Total	n	%	Total
10 - 13 year	5	8.9	56	7	17	41	13	13.4	97
14 -16 year	2	4.8	41	3	6.7	49	5	5.5	90
17 - 19 year	1	3.3	33	3	7.8	38	4	5.6	71
Female									
10 -13 year	2	3.9	51	5	10.6	47	7	7.1	98
14 -16 year	1	2.3	42	2	6.0	30	3	4.2	72
17 -19 year	2	6.2	32	3	6.6	45	4	5.2	77
Total	13	5	255	23	9.2	250	36	7.1	505

Table 5: Prevalence of obesity according to socio demographic characteristics

Characteristics	Obese			Chi Square test	
Male	No.	%	Total	x² Value	P-value
10 - 13 year	20	16	195		
14 -16 year	8	4.9	162	6.25	0.001*
17 - 19 year	8	6.4	148		
Residence					
Rural	13	5	255	5.42	0.02*
Urban	23	9.2	250		
Gender					
Male	22	8.5	258	10.86	0.001*
Female	14	5.7	247		

Conted…

Residence					
Rural	15	5.9	255	6.68	0.001*
Urban	30	12.0	250		
Gender					
Male	25	9.6	258	4.67	0.03*
Female	20	8.1	247		

Table 6: Prevalence of overweight according to socio demographic characteristics

Characteristics	Overweight			Chi Square test	
Age	No.	%	Total	X² Value	P - value
10 - 13 year	25	12.8	195		
14 -16 year	10	6.2	162	6.35	0.01*
17 - 19 year	10	6.8	148		

RESULTS

In this study, a total 505 Adolescent were there out of which 255(50.5%) were from rural area and 250(49.5%) were from urban area. The males and females were 258(51%) and 247(49%) respectively. According to the age group, 195(38.7%), 162(32%) and 148(29.3%) belonged to age group of 10-13 year, 14-16 year and 17-19 year of age respectively. Out of 505 Adolescent, 396 (78.5%) were Hindu and 109(21.56%) were Muslims. On analyzing, 17.6% Adolescents had family comprising of less than 5 members, 31% had between 5-7 members in family and 50.5% of studied population resided in Kuccha and Semi Pucca houses. Majority of adolescent resided in joint family 374 (74%). Regarding overweight 45(8.9%) adolescent were found

overweight according to WHO growth charts results. The prevalence of overweight in male in age group of 10-13 years, 14-16 years and 17-19 years was 15.5%, 5.6% and 7% respectively. The prevalence in same order for female was 10.20%, 6.9% and 6.4%. The prevalence of overweight for urban male and urban female in early, mid and late adolescent period was 21.9%, 6.1% and 10.5% and 17%, 10% and 6.6% respectively. In regards of rural and urban area the prevalence of overweight was 5.9% and 12% respectively. Regarding gender, in male and female the prevalence of overweight was 9.7% and 8.1% respectively. When Chi Square test was performed the difference was statistically significant for residence, age and gender. The overall prevalence of obesity was 36(7.1%) as per WHO growth chart. The prevalence of obesity in urban males in early, mid and late adolescence was 17%, 6.1% and 7.8% respectively. The prevalence in the same order for urban female was 10.6%, 6% and 6.6%. For rural males and females the prevalence in early, mid and late adolescence was 8.9%, 4.8% and 3.3% and 3.9%, 2.3% and 6.2% respectively. According to the age, the prevalence of obesity for early, mid and late adolescent group was 16%, 4.9% and 6.4% respectively. The prevalence was 5% and 9.2% respectively for rural and urban area respectively.

In regards to gender, male and female had a percent prevalence of 8.5% and 5.7% respectively. When Chi Square test was performed the difference was statistically significant for residence, age and gender.

DISCUSSION

WHO defines overweight as BMI for age greater than 1 SD above the WHO growth reference and obesity as greater than 2 SD above the WHO growth charts. Childhood obesity affects all socio–economic groups of both developed and developing countries. There is increase in prevalence of obesity from 1990 to 2010[9] using the WHO standards overall prevalence of overweight and obesity among adolescent was calculated as 9.69% and 7.1% for male and females respectively. This is consistent with a other study conducted by Kotian MS et al[10]. Prevalence of both overweight and obesity was higher among boys as compared to girls (9.6% vs 8.1%), 8.6% vs 5.6%. Our findings are comparable with the findings of other studies[11, 12]. On analyzing the data in the form of gender, residency status and age groups, the prevalence of overweight was higher (21.9%) among

urban males of 10 -13 years of age group. This finding is consistent with other study also[13]. The urban females in early adolescent reported 2nd highest prevalence of overweight and obesity of 11.4% and 10.6% respectively. Our findings are similar to study conducted at Kharagpur District of West Bengal which found a prevalence of overweight among girls in early adolescent as 10.62%[14]. In overall urban participants had significant rate of prevalence of overweight (10% vs 5%) and obesity (9.4% vs 5%) than the rural participants. These findings are consistent with study conducted by Ghosh A.[15] but in other study conducted by Levuva m et al in Ahmedabad found the prevalence of obesity of 62.1% and 37.9% in urban and rural adolescents. This higher prevalence of obesity might be attributed to the facts that Ahmedabad is a metro city and children have more access to the fastfood and high caloric food stuffs. But there is alarming time to wake up, as overweight and obesity is increasing from 4.94% in 2003 to 6.57% in 2005 by a study conducted in South India[16]. Regarding socio-economic trends in childhood obesity, the prevalence of obesity was found 5.59% in higher socio-economic strata as compared to lower socio-economic strata, where prevalence was 0.42%[17]. Trends of prevalence of obesity and overweight also increasing with time in China, the prevalence was 1-2 % in 1985 and 17% in girls and 25% in boys in 2000[13]. It has been found in last 30 years the prevalence of obesity has increased dramatically world wide[18, 19]. It is well documented that obesity is an independent risk factors for increased rate of cardiovascular diseases, type 2 DM and reduced life expectancy in later part of life[20, 21].

CONCLUSION

Overweight and obesity in adolescent and children are rising to significant levels throughout the world. The prevalence is increasing in all socio- economic strata, irrespective of gender, age and ethnicity. But prevalence is increasing more in urban children. So we have to focus on children and adolescent to teach them healthy dietary habit, outdoor games, exercise, for which we have to organize various educational program in school and society.

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Effectiveness of Superbrain Yoga on Short-term Memory, Visuo-spatial Ability and Academic Performance of Students

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ABSTRACT

Background: Superbrain *Yoga* (SBY) is a simple squatting technique that uses subtle energy to improve cognitive functioning of individuals. It is based on the principle of ear acupuncture, and subtle energy movement in the body.

Aim: The present study aims to study the effectiveness of SBY on the short-term memory, visuo-spatial ability and academic performance of students.

Setting and design: The study was conducted on 65 students from a residential school, of which 27 were females and 37 were males. The sample was in the age range of 10 to 14 years and the mean age was 12.56 years.

Method: Monkey ladder and rotation tests were used to assess the short-term memory and visuo-spatial ability of the students respectively.

Statistical analysis The pre-test and post-test data was collected and the scores were analysed using repeated measure ANOVA.

Results: Showed that there was a significant improvement in the short-term memory, visuo-spatial ability and academic performance of students after the implementation of SBY. Also, there was no differential gain in short-term memory, visuo-spatial ability and academic performance based on gender.

Conclusion: SBY could be used by students for better cognitive functioning.

Keywords: Superbrain yoga, Short-term memory, Visuospatial ability, academic performance.

INTRODUCTION

The human brain being more powerful and sophisticated than any existing computer, it becomes necessary to maximise its potential for better work output and holistic wellbeing. There has been constant research in this area for the same reason. The synapses – point connection of the neurons in the brain- need to be created and conserved for the brain to stay healthy and alert throughout life. Many techniques to optimize brain wellness are reported. Among them Superbrain *Yoga* (SBY) is one of them. It is initiated by squeezing ear acupuncture points by fingers with hands placed across the chest and involves 14 squats with recommended breathing. This simple technique of SBY offers complex benefits not just for students, but also for adults seeking brain wellness. [1]The Superbrain exercise partially

cleans and energizes the energy centres needed for the brain to function efficiently. *Chakras* or whirling energy centres absorb, digest and distribute *prana* to the different parts of the body and are responsible for the proper functioning of the human. Once the energy gets up to the forehead and crown chakras, it is transformed into subtle pranic energy, which is utilized by the brain for its proper functioning.[1]

SBY could also be looked at from the point of it being a form of physical exercise. Research has found that there is a positive effect of any physical activity in improving attention and enhancement of cognitive performance and brain function.[2] Studies also indicate that coordinated exercise increases one's attention.[3]SBY being practised on a regular basis becomes a coordinated exercise and also a physical activity contributing towards the brain

wellness of the child. When the brain waves are in an Alpha state, the children is more calm, relaxed and alert. [4] This helps the prefrontal lobes of the brain in higher level thinking tasks which help a child to pay attention, focus, gain knowledge and remember[5]. Regular practice of SBY for thirty days improved anxiety management among adolescents [6] and selective attention of students. [7] Alpha wave activity among students increases after practicing SBY for a month[8]. Therefore, regular SBY practitioners consistently enjoy much more time in the Alpha state than non practitioners, thereby increasing their memory, creativity, intuition and overall health.

Short-term memory: Short-term memory also known as the immediate memory, is where the information is passed on to from the sensory register. Information which is attended to and recognised in the sensory register is held in the short-term memory for 20 to 30 seconds. Short-term memory represents the brain ability to hold and process discrete information about what you are doing at the present moment. Short-term memory is used in processing information, and it is widely used during games which involve number sequencing. These games involve areas in the brain, mainly the prefrontal and parietal cortex. Studies began to show that learning, reasoning, organising priorities, managing time, staying focussed and handling stress were all dependent on a healthy short-term memory capacity. Training the short-term memory would improve other cognitive abilities and have a real impact on daily life.

Visuo-spatial ability: Visuo-spatial abilities are those related to understanding and conceptualizing visual representations and spatial relationships in learning and performing a task. Mental rotation, as a function of visual representation in the human brain, has been associated with the right cerebral hemisphere. It is associated with the cognitive rate of spatial processing, general intelligence and perception.[9] In humans, the parieto-occipital region is believed to process visuospatial and visual motion types of information. Whereas, the infero-temporal region of the brain is believed to mediate our ability to process visual information about the form and colour of objects.[10]

METHOD

Research design: A quantitative framework was adopted in the study. A pre-test post-test design was used where the dependent variable was measured once in the pre-test period, that is prior to the intervention and the post-test period, which is after the intervention. The present study compared the short-term memory and visuo-spatial ability of students before and after the implementation of SBY.

Sample: The participants chosen for this present study were students from Residential School, in , Mysore, Karnataka. 64 students were selected using random sampling technique, of which 37 were males and 27 were females. The sample was chosen based on the inclusion and exclusion criteria.

Inclusion Criteria:

- Age group of 10 to 14 years

- Those interested in practicing SBY

Exclusion Criteria:

- Those who are previously exposed to SBY practice in the past.

- Those having any psychological ailments

TOOLS

Socio-demographic checklist: This was developed to document participants' basic information such as name, gender, age and level of education.

Examination scores: The examination scores of students on the previous examination was taken prior to the implementation of SBY and the examination scores were once again recorded after the implementation of SBY. The scores were taken and the aggregate of each student was calculated to see if there is a change in the academic performance of the students after the implementation of SBY.

Monkey Ladder test: In this test one has to remember where numbers appears on the screen. The numbers after a while would disappear. They are replaced by boxes. One has to click boxes in numerical order. If it is correct the next problem would have one more box to remember.

Rotation Test: This test assess the ability to mentally rotate objects, as you can see there are two boxes on the screen each filled with red and green squares. If you could rotate on of the boxes, would it be identical to the other or would it be different. If it would be identical then

click match, if it would be different then click mismatch. This is an online test to provide a freely available web-based platform for members of the public and the wider scientific community to assess their cognitive function using rigorously tested and scientifically proven tests of memory, attention, reasoning and planning.

Table 1: Socio demographic profile

Socio demographic profile.	Variable	F	%
Gender	Male	37	57.8
	Female	27	42.1
Education	Sixth standard	18	28.1
	Seventh standard	25	39.0
	Eighth standard	21	32.8
Locality	Urban	19	29.6
	Rural	45	70.3

Procedure: The first step was to short list the students based on the inclusion and exclusion criteria. This was done by collecting all the necessary data using the socio-demographic sheet (Table 1). Once the students were short listed the pre-test data from them was performed and collected. Next, the students were introduced to SBY, the theory behind it and the procedure involved. The students were instructed to practice SBY every morning for 14 times consecutively before they left to school. Weekly visits were paid by the investigators to mentor students about the practice and to guide them if necessary. After one month of regular SBY practice, the post test data was collected by running the test again, and the scores were recorded. The obtained data was statistically analysed and results were interpreted. Descriptive statistics and Repeated measure ANOVA was used to understand the effectiveness of SBY on memory, visuo-spatial ability and academic performance of the students.

RESULTS AND DISCUSSIONS

The results show there is a significant improvement in short-term memory from pre-test to post test for the entire sample ($F=1.97$, $p=.002$). Next, there was a significant improvement in visuo-spatial ability from pre-test to post test ($F=27.42$, $p<.001$). Further, the results showed that there was a significant improvement in the academic performance from pre-test to post test ($F=423.85$, $p<.001$). However, there was no differential gain in the short-term memory ($F=.011$, $p=.918$), visuo-spatial ability ($F=.121$, $p=.730$) and academic performance ($F=.245$, $p=.621$) based on gender of the student (Table 2).

Table 2: Pre and Post test scores of Short-term memory, visuo-spatial ability and academic performance of students

Variable	Gender	Session				Gain	Statistics
		Pre-test		Post-test			
		Mean	SD	Mean	SD		
Short-term memory	Male	5.59	0.98	6.13	1.03	0.54	Gender F=.011, p=.918
	Female	5.62	1.49	6.22	1.18	0.6	
	Total	5.6	1.21	6.17	1.09	0.57	Total F=1.972, p=0.002
Visuo-spatial ability	Male	18.24	29.89	40.02	3.87	21.78	Gender *F*=.121, *p*=.730
	Female	42.37	38.29	57.33	42.00	14.96	
	Total	25.85	34.59	47.32	36.69	21.47	Total *F*=27.42, *p*<.001
Academic performance	Male	241.8	30.7	319.3	41.01	77.5	Gender *F*=.245 *p*=.621
	Female	321.9	72.33	395.8	56.84	73.9	
	Total	275.6	65.49	351.6	61.18	76.0	Total *F*=423.85, *p*<.001

The results revealed that there was a significant improvement in the short-term memory of students after implementation of SBY practice. A study by Hillman[2] and his co-workers noticed that there is a positive effect of any physical activity in improving attention and enhancement of cognitive performance and brain function among children's. SBY in particular may facilitate this process.

Superbrain squat moves energy trapped in the basic chakras and sex chakras through the physical body's other major energy centres and finally up into the crown chakra or crown energy centre that controls the pineal gland and overall brain health. As the energy moves upward and fills the heart energy centre, the student is filled with love and experiences inner peace or calm. When the energy moves up further into the throat and ajna chakra energy centres, the student's intelligence and creativity are enhanced. Once the energy gets up to the forehead and crown chakras, it is transformed into subtle pranic energy, which is utilized by the brain for its proper functioning. [1] After performing SBY leads to increases in Alpha wave activity[8]. Watson[11] observed increase in Alpha waves had a long-term improvement of memory functioning, speed of information, processing, perceptiveness and decision-making ability and problem-solving. The present study shows that there was a significant change in the short-term memory of students which may be due to the increase in the alpha wave activity in the brain.

The results revealed that there was a significant improvement in the visuo-spatial ability of students after implementation of SBY practice. Few studies in the past have probed into this aspect using specific exercises which are similar to the SBY exercise. In a study by Koterba[12] a seven year-old boy with a diagnosis of attention deficit/ hyperactivity disorder and pervasive developmental disorder, who was in the 20th percentile on the Developmental test visual perception, had improved to the 75th percentile in a period of one year.The results showed in the study may be contributed by the increased alpha brain power and it is an evidence of relaxed condition and decrease arousal. A study by Ramesh[13] revealed that alpha wave activity was high especially in the Frontal & Occipito – parietal regions which was witnessed in the Single Amplitude Map program. It has been found that the visuo-spatial ability of a student is confined to the occipital and parietal regions of the brain. An increase in these regions during SBY may be contributed to the improvement in the visuo-spatial ability of the students as well.

The results revealed that there was a significant improvement in the academic performance of students after implementation of SBY practice. It was very evidently seen that there was a significant improvement in the student's test scores. School teachers also noticed a positive change in student's performance and behaviour in the classroom. In a study conducted on middle school students, it was seen that there was an increase in the performance scores on standardised test, improved shifts in academic sections and an increase in student participation in the classroom. Mendoza[14] in his study on children with disabilities, including neurological defects, autism, seizure disorder, cognitive delay and specific learning disabilities, witnessed that these children performed better on reading and writing tasks, and they displayed less problem behaviour.In the present study, we can see that there has been a significant improvement in the short-term memory and visuo-spatial ability of students after the implementation of SBY. Short-term memory is one of the key components in learning. A significant improvement in the short-term memory may have further contributed to the better performance in the examination. Visuo-spatial ability of the student, which was significantly improved after implementation of SBY, is also thought to be associated with the cognitive rate of spatial processing and general intelligence[15,16] and hence might be a contributing factor in the academic performance of students. Hence, taking all these factors in to consideration, the findings of the present study could be explained.

The results revealed that there was no differential gain in short-term memory and visuo-spatial ability after implementation of SBY, based on gender of the student. The effect of SBY has been uniform among both male and female students. This is supported by recent study conducted by Jois[7] where there was no significant difference in the effectiveness of SBY on the psychological wellbeing of students, based on gender. This may be explained by the fact that SBY mainly deals with the transmission of energy from lower chakras to the higher chakras, and this transmission is not affected by the gender in any way.

The present findings could be applied at schools. Schools can use this simple technique every day to improve the cognitive functioning of the students and to help students with academics and performance. It can further be applied to students who have been given a secondary diagnosis due to academic related difficulties. Next, increased physical activity can decrease the proneness to obesity issue and physical ailments. Acupressure energy points for the brain, eyes, forehead, mouth, ovary, parotid, temple, and testes congregate

around the area of the ear affected by pressure from this exercise. In addition, the finger pads used in the exercise have acupressure energy points for the brain as well as pineal and pituitary glands. Finally, one of the most important aspects of SBY is that it is cost-effective and could be practiced by anyone. There is no need for one to spend money on medicines and commercial camps. It is easy to learn and consumes very less time for its practice.

CONCLUSION

In conclusion, it could be said that SBYa can be considered to improve the working memory, visuo-spatial ability and academic performance of the students. This could be very beneficial for students since it could help them in academic related and learning processes. It could be used as an adjunctive therapy to improve the overall cognitive functioning of students. SBY could also be used as an effective exercise to improve the psychological wellbeing and overall health of students.

Conflict of Interests: All the authors reports no conflict of interests

Ethical clearance: Permission is obtained from Social Welfare Department, Government of Karnataka to conduct the study.

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Understanding Determinants of Stunted Children in Poor Rural Area of Indonesia

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ABSTRACT

Background: Stunting is a malnutrition problem globally, including in Indonesia. This research aims to know the determinants of stunting in Indonesian poor rural area children.

Method: A cross sectional study using the Indonesian Basic Health Research 2013. The population samples included 775 children of 6-23 months ages, selected by multistage cluster sampling. The inclusion criteria were poor families and living in rural areas, while the exclusion criteria were height for age (HAZ) score ≥ 6 and $\leq$-6 SD. Independent variables were children's and parent's characteristics while the dependent variable was stunting. The data was analyzed by multivariate tests using Stata version 13.

Results: The prevalence of stunting was 41.42%. Factors associated with stunting were found including the ages of children ie. 18-23 months: (AOR: 1.62, CI 95% 1.28-2.05); 12-17 months: (AOR: 1.42, CI 95% 1.11-1.81), the LBW (AOR: 1.43, CI 95% 1.17-1.74), and the short maternal (AOR: 1.2, CI 95% 1.09-1.52). Exclusive breastfeeding and vitamin A supplementation were protective factors for stunting but not significant (AOR:0.93, CI95% 0.78-1.09 and AOR 0.95, CI95% 0.75-1.21 respectively)

Conclusion: The older age, LBW, short maternal stature are significant risk factors for stunting.

Keywords: 6-23 mo's, stunting, poor family, rural area, determinant factors

INTRODUCTION

Stunting is a growth linear retardation, due to chronic lack of nutritions and impairing healthy life cycle leaving permanent squele throughout life and maybe inherited across generation[1]. Globally in 2014, 23.8% or 159 million children in the world suffer from stunting of which 8.5 million living in Indonesia.[1] The basic health research undertaken periodically by the Ministry of Health Republic of Indonesia have shown high prevalence, ie. 36.8%[2], 35.6%[3] and 37.2%[4] in 2007, 2010, 2013 respectively.

The consequences of stunting, either the short or the long terms ones, including: decline in cognitive function, developmental disorders, low motoric system function and language skill, increased risk of sickness and irreversible dysfunction, brain developmental disorders[5-6], low cognitive achievement[7-8], adult short stature, low adult productivity, and also degenerative diseases[9]. According to central bureau of statistics Indonesia 2013, as many as 8.52% (10.68 million) Indonesian people lived in urban poor areas, while 14.42% (17.92 million) lived in rural poor areas[10]. People who lived in rural poor areas have many barriers for assessing good health services, water and sanitation and facing insufficient good quality food intake, they are vulnerable to various form of malnutrition problems including stunting. Therefore this study was undertaken to investigate the determinant for stunting in poor rural Indonesian children.

METHOD

Research design: A cross sectional study, using the data from the Indonesian Basic Health Research 2013.

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Population and samples: The sampling was a multistage cluster sampling, with households in 33 provinces and 497 districts and municipalities, as population. The samples study included 775 children, between 6-23 months, purposively selected using relevant inclusion, i.e. from poor families and living in rural areas, and the exclusion criteria were HAZ score ≥ 6 and ≤-6 SD.

Variables: Independent variables were children's characteristics such as age, gender, history of breast feeding and complementary feeding, vitamin A supplementation, newborn length, birth weight and parent's characteristics such as formal education, height, number of under five children and number of family members. The dependent variable was stunting.

Instrument: Determinant stunting and HAZ score data were collected by individual and household questioners from Basic Health Research 2013.

Data analysis: Bivariate analysis was undertaken by logistical regression, while multivariate analysis by poisson. The most parsimonius and the best fit model was used at the end of the analysis. The entire analysis was tested using STATA 13. This research was approved by Medical Health Research Ethic Commision Gadjah Mada University no KE/FK/0099/2017, 27th Januari 2017.

RESULTS

Children characteristics: The study show that the prevalence of stunting children is 41.42 %, as detail in Table 1.

Table 1: Characteristic of 6-23 Months Poor Rural Indonesian Children

Variable	n (775)	%
Children's Age (months)		
6-11	208	26.84
11-17	278	35.87
18-23	289	37.29
Sex		
Boys	388	50.06
Girls	387	49.94
Nutritional Status		
Stunting	321	41.42
Normal	454	58.58
Birth Weight (grams)		
Low (<2500)	78	10.06
Normal (≥2500)	697	89.94

Conted…

Variable	n	%
Birth Length (cm)		
Short (<48)	163	21.03
Normal (≥ 48)	612	78.97
Vitamin A Supplementation		
Never	128	16.52
Yes	647	83.48
Exclusive Breastfeeding		
No	478	61.68
Yes	297	38.32
Complementary Breastfeeding (mo's)		
< 4	361	46.58
4-6	117	15.10
>6	297	38.32
Province Group		
Jawa Bali	194	25.03
Sumatra	260	33.55
Kalimantan	120	15.48
Sulawesi	89	11.48
East Indonesia (Papua, West Papua, Maluku, North Maluku)	112	14.45

Sosiodemography Characteristics: The socio-demography characteristics of the parents were described in Table 2.

Table 2: Sociodemography Characteristic

Variable	n	%
Mother's Age (years)		
< 20 & > 35	202	26.06
20 – 35	573	73.94
Father's Age (years)		
< 20 & > 35	373	48.13
20 – 35	402	51.87
Mother's Education		
Low	649	83.74
Middle	105	1.55
High	21	2.71
Father's Education		
Low	620	80.00
Middle	133	17.16
High	22	2.84
Mother's Job Status		
No	444	57.29
Yes	331	42.71
Total	**775**	**100.00**

Conted…

Father's Job Status		
No	24	3.10
Yes	751	96.90
High's Mother (cm)		
Short (≤ 150)	324	41.81
Normal (>150)	451	58.19
High's Father (cm)		
Short (≤ 160)	278	35.97
Normal (>160)	497	64.13
No of Under Five Children		
≥3	14	1.81
2	158	20.39
1	603	77.81

Conted…

No of Household Member		
3-4	415	53.55
5-6	288	37.16
>6	72	9.29
Total	**775**	**100.00**

Association between sociodemography and stunting: The association between sociodemography characteristics and stunting was depicted in Table 3. Significant correlations were found between stunting and older age of children, LBW and short newborn length, (OR 1.48, CI95%1.03-2.13), many of under five children in family, and short stature mother.

Table 3: Stunting, Sociodemography and Children Characteristic

Variable	Stunting				P	OR (CI95%)
	Yes		No			
	n	%	n	%		
Children Characteristic						
Children Age (months)						
6-11	62	29.81	146	70.19		1
11-17	118	42.45	160	57.55	0.006	1.42 (1.11-1.83)
18-23	141	48.79	148	51.21	0.000	1.64 (1.29-2.01)
Sex						
Boys	168	43.40	220	56.70	0.287	1.17 (0.87-1.57)
Girls	153	39.53	234	60.47		1
Birth Weight (grams)						
Low	46	58.97	32	41.03	0.0009	2.21 (1.34-3.67)
Normal	275	39.45	422	60.55		1
Birth Length (cm)						
Short (<48)	80	49.08	83	50.92	0.025	1.48 (1.03-2.13)
Normal (≥ 48)	241	39.38	371	60.62		1
Vit A Supplementation						
Never	49	38.28	79	61.72	0.430	0.855 (0.571.28)
Yes	272	42.01	375	57.96		1
Exclusive Breastfeeding						
No	193	40.38	454	58.58	0.455	0.89 (0.66-1.21)
Yes	128	43.10	169	56.90		1
Complementary Breastfeeding (months)						
<4	154	42.66	207	57.34	0.91	0.99 (0.83-1.18)
4-6	39	33.33	78	66.67	0.08	0.77 (0.58-1.03)
>6	128	43.10	169	56.90		1
Mother's Age (years)						
< 20 & > 35	79	39.11	123	60.89	0.44	0.88 (0.62-1.23)
20 – 35	242	42.23	331	57.77		1

Conted…

Father's Age (year)						
< 20 & 35	149	39.95	224	58.58	0.42	0.089 (0.66-1.19)
20 – 35	172	42.79	230	57.21		1
Father's Education						
Low	264	42.58	356	58.58	0.11	1.87 (0.86-4.07)
Middle	52	39.10	81	60.90	0.18	1.72 (0.77-3.83)
High	5	22.73	17	77.27		1
Mother's Education						
Low	276	42.53	373	57.47	0.076	2.23 (0.92-5.42)
Middle	41	30.05	64	60.95	0.124	2.05 (0.82-5.11)
High	4	19.05	17	80.95		1
Mother's Job Status						
No	267	60.14	177	39.86	0.31	0.86 (0.64-1.16)
Yes	144	43.50	187	56.50		1
Father's Job Status						
No	10	41.67	14	58.33	0.98	1.01 (0.39-2.48)
Yes	311	41.41	440	58.59		1
Household Member						
3-4	166	40.00	249	60.00		1
5-6	124	43.06	164	56.94	0.417	1.08 (0.90-1.8)
>6	31	43.05	41	56.94	0.620	1.07 (0.8-1.44)
No of Under Five Age						
1	228	37.81	375	62.19		1
2	84	53.16	74	46.84	0.000	1.41 (1.18-1.68)
>=3	9	64.29	5	35.71	0.010	1.7 (1.14-1.55)
Mother's High (cm)						
Short (≤ 150)	155	47.84	169	52.16	0.002	1.57 (1.17-2.13)
Normal (>150)	166	36.81	285	63.19		1
Father's High (cm)						
Short (≤ 160)	128	46.04	150	53.96	0.05	1.34 (0.99-1.82)
Normal (>160)	193	38.83	304	61.17		1

Multivariable Analysis: The best fit model was indicating that stunting children have strong association with the age of the children, 18-23 months: (AOR: 1.62, CI 95% 1.28-2.05); 12-17 months: (AOR: 1.42, CI 95% 1.11-1.81), low birth weight (AOR: 1.43, CI 95% 1.17-1.74), short maternal height (AOR: 1.2, CI 95% 1.09-1.52). Exclusive breastfeeding and vitamin A supplementation were protective factors for stunting but not significant (AOR: 0.93, CI95% 0.78-1.09 and AOR 0.95, CI95% 0.75-1.21 respectively) (Table 4.)

Table 4: The Best-Fit Model Analysis of Risk Factors Associated with Stunting

Variable	AOR	95% CI
Age Children (months)		
12-17	1.42	1.11-1.81
18-23	1.62	1.28-2.05
LBW	1.43	1.17-1.74
Short Stature Mother	1.2	1.09-1.52
Vitamin A Supplmentation	0.92	0.75-1.21
Exclusive breastfeeding	0.91	0.78-1.09
Constanta		0.27
AIC		1232.46
BIC		1199.89

DISCUSSION

Age of Children. The risk of stunting increases with aging. Children of 12-17 and 18-23 months age are likely to be stunted (AOR 1.42 CI95% 1.11-1.81, AOR;1.62 CI95% 1.28-2.05 respectively). The earlier studies also show that stunting was more prevalent in older children11-12 months, and the differences of the growth rate are influenced by various internal and external factor[13-14]. Stunting at under five period has strong association with adult stunting and other conditions, i.e: adult short stature, developmental disorders, and low adult productivity, degenerative diseases[9], increased risk of sickness and irreversible dysfunction, and brain developmental disorders[6-8]. However, it is important to give interventions at early life to avoid the severity of stunting.

Birth Weight. Babies with low birth weight (LBW) are likely to be stunted than normal ones (AOR 1.43, CI95% 1.17-1.74). Birth weight is the strongest stunting predictor especially for 12 month below and risks to remain stunting in children[15]. More than one third (36.1%) of Indonesian preschool children were stunted[4], showing a pattern of low birth weight and chronic malnutrition[14-15]. Longitudinal studies show that boys and girls of 17-19 years age who were IUGR-LBW are 5 cm shorter and 5 kgs lower than those with history of normal baby born[15]. LBW impact also include children's physical and development retardation, stunting during children[16], adolescents and adults[5,10] having low learning achievements[7], and loss of job and incomes[17], and increased risk of degenerative disease[17-18] and other serious health disease[18].

Normal birth weight is outcome of sufficient nutrition on maternal pregnancy. Studies show that central stimulus for programming growth, size at birth and adult degenerative disease could be done by altering or manipulating nutrition on pregnancy period[19]. The pseudo experimental study about Dutch Hunger Winter show that mother who are exposed to nutritional insufficiency have offspring with reduced birth size and an increased risk of glucose tolerance and obesity in adult life[19]. Therefore, family can provide necessary intervention during period of window opportunity by accesing a thousand (1000) days early life so babies low birth weight can reach their recatch up growth optimally[20].

Maternal Height. This study show that short maternal stature is more likely to have association with stunting (AOR:1.2, CI95% 1.09-1.52). Varela-Silva MI, et al, (2009) show that maternal height was the only unmodifiable biological variable to have a strong positive[13] and direct effect on height in preschoolers, even though the children live in such disadvantages setting, i.e rural, slum area and poverty[19]. Maternal height have strong association with size of birth, every 1 cm increase of parent's (mother and father) height will lower the risks of stunting with a relative risk (RR) of 0.98 and 0.97 respectively[13]. Unfortunatelly, as many as 58.6% of the stunted children here have a stunted parent[13]. Other research show that a 1-cm increase in maternal height was associated with 0.024 (95% CI: 0.021-0.028) SD increase in offspring birth weight z-score and with 0.078 (95% CI: 0.074-0.083), 0.080 (95% CI: 0.077-0.085), and 0.082 (95% CI: 0.079-0.086) SD increases in attained HAZ at 2 years, Mid childhood, and adulthood, respectively. Short mothers were more likely to have a child who was stunted at 2 years RP 3.20 (95% CI:2.80-3.60) and as an adult RP 4.74 (95% CI: 4.13-5.44)[21].

Exclusive Breastfeeding. Breast milk is an appropriate source of nutrition for children under 24 mo's, and practicing exclusive breastfeeding 0-5 mo's can protect against stunting[22-23], even though this study show that these association is not statistically significant (OR 0.91, CI 95% 0.78-1.09). Breast milk is important to infant growth and development, providing the infants with immunological protection, and is generally free from contamination[23].

Vitamin A Supplementation. This study show that vitamin A supplementation protect against stunting, but not statistically significant (OR 0.92, CI95% 0.75-1.21). In Kenya, vitamin A supplementation support survival life and growth children, and decreasing of diarhea[24], while a RCT study in Indonesia show that children who received iron and vitamin A supplementation was taller than children who received Fe only (p=0.026)[25]. Clinical vitamin A deficiency has long been linked to poor child growth on a cross-sectional basis; often the more severe the eye signs, the more severe the stunting and wasting, children who develop mild xerophthalmia (night blindness or Bitot's spots) also show less weight gain and linear growth than their non xerophthalmic peers[26].

CONCLUSION

The prevalence of stunted children 6-23 mo's in the poor rural Indonesia areas was 41.42%, with determinant factors including: age, LBW and short maternal height. Findings suggest to the health policy programs to prevent this stunting children by improving maternal status, prevention of stunting childhood risk factors during the first 1000 days of life also improving child caring and health.

Conflict of Interest: Nil

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Fire Risk Analysis with Fishbone Analysis Method in Surabaya Hospital

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ABSTRACT

Fire is a disaster that comes from the unwanted flame that can cause losses. Surabaya hospital is a teaching hospital and a government referral hospital that provides various medical services such as x-rays, hemodialysis, laboratory, etc. All of those services also have a risk of fire.

This research aims to analyze the hospital's policy and its compliance on fulfilling the standard regarding the prevention and the countermeasures of fire in Surabaya Hospital by using Fishbone Analysis method. This research is descriptive with cross-sectional design conducted in February 2017. The sampling technique in this research is purposive sampling technique which is two persons as informants, those are the Head Division of General Matter and the Head of Maintenance Facility Installation at Surabaya Hospital. The population is all room with the risk of fire in Surabaya Hospital. The data collection technique is using thequestionnaire in interviews and the observation checklist sheet.

The research result shows that Surabaya Hospital has already had all policy regarding the prevention and the countermeasure of fire accident (100%) and as a whole for the percentage of thesuitability of compliance regarding its fire protection system is in a good category (41,4% + 48,3% = 89,7%). But from the total fulfillment, there are around 48.3% which still not up to the regulation standard. This condition will have a big impact on the effectiveness of the fire protection system itself, just in case, the fire accident happens in Surabaya Hospital. Base on that result, Surabaya Hospital need to form cooperations with the experts of Occupational Health and Safety matter on fulfilling the fire protection system so it in accordance with the regulatory standard in Indonesia.

Keywords: Hospital, Fire Risk

INTRODUCTION

On Law Number 1 Year 1970 about Occupational Safety, Chapter III The Requirements of Occupational Safety, article 3 verse 1, point b and c, states that one of the requirements of occupational safety is preventing, minimizing, and extinguish the fire, also preventing and minimizing the flame hazard[25]. This regulation becomes one of the bases of the obligations to control the risk of fire and explosions.

Fire accident according to The Department of Labor is an exothermic oxidation reaction which takes place rapidly from a fuel that is accompanied by the ignition. The general definition is an event of undesirable flame, while the specific definition is an event of oxidation among three elements of the cause offire[8].

The data from the Centre of Forensics Laboratory of the Headquarter of Indonesian Police in 2001 states that 80% of fire accidents happened at the workplace, where the 34% of it is caused by open flames, 31% caused by the electricity and 20% caused by inadequate facilities such as the failure of fire protection system, untrained staffs, procedural error, and the obstacles of accessing aids[7].

The official data from United State National Fire Protection Association (US NFPA) in 2008 describes the fire accident in the United States in which the accident rate reached about 5 million times from 1999 to 2008, with a loss up to $93.426[7].

In Indonesia itself, according to the Department of Firefighter and Disaster Management, there are fire cases as many as 8.243 in Jakarta from 1998 to 2008 with a loss up to Rp 1.255.091.940.080[7]. Meanwhile, the data from the government of Surabaya District, the fire accident from 2015 was 460 cases, until early 2016 is as

many as 15-20 cases and this number can still increase since it still in the middle of the year of 2016[8].

Hospital is a health service institution that administers personal medical services in a plenary manner providing inpatient care, outpatient care, and emergency care[8]. The hospital in supporting its services is equipped with several facilities such as inpatient unit, outpatient unit, polyclinic, warehouse, medical record, chemical warehouse, and so on. But, of course, all of those existing facilities have the risk of fire. More over in the hospital which is inhabited and visited by many people who are vulnerable or the people who in need of medical services. Base on this condition, we can say that the hospital is very vulnerable or risky from disasters such as fire accident.

The fire occurred in the hospital was not a little in number, for example, the fire happened in India Hospital in Kolkata on December 9th, 2011. This accident killed 89 people and made the entire building burned. The fire was allegedly coming from short-circuiting[4].

The fire also occurred in Saudi Arabia Jazan Hospital at December 24th, 2015, precisely at the maternity room with 100 peoples injured and 25 died. On that event, where the majority of victims was in the ward, the cause of the fire was allegedly coming from electricities problem and previously the hospital disobeyed the safety standard[9].

Fire accidents occurred in Indonesia is the fire at dr. R. Soeharsono Hospital in Banjarmasin at Friday, January 1st, 2016, 00.45 WITA. The cause of fire was allegedly coming from fireworks or flare gun used by the sailors[5].

Several factors that worsen the fire accident and causing huge losses are the inadequacy of fire protection facilities, either because of the inappropriate use or the incompatibility of the fire protection system specification, also the unavailability of the experts on managing the fire.

The losses caused by the fire is very big. Not only direct losses but also can cause indirect losses such as the hospital failure on providing its services, compensation fee for the workers, and also the decrease on the image of the hospital, etc. Because of those much potential losses, there is a need for fire prevention or at least efforts to

reduce the risk if the fire occurred again. Therefore, this research aims to analyze the risk of fire using fishbone analysis method in Surabaya hospital.

MATERIAL AND METHOD

Participant: This research is descriptive with across-sectional design and conducted for 1 month in February to March 2017 in Surabaya Hospital.

The population in this research is all unit rooms in the hospital that have risks of fire accident consist of anoutpatient poly room, inpatients room, nutrition room, hemodialysis room, ICU, Facilities Maintenance Installation, secretariat room, and logistic room. The sample collection on this research using purposive sampling technique amounted to two persons as an informant, those are the Head Division of General Matter and the Head of Facilities Installation and Maintenance. The data collection technique is using thequestionnaire in an interview and the observation checklist sheet.

PROCEDURE

The initial step of this research was observing each room or working unit in the hospital that at the risk

If the hospital policies have been identified, the next step is analyzing the degree of compliance of its fulfillment. To identify this matter, the researcher used checklist sheet and other research aids such as a digital camera for documentations and meter tool for measuring.

DATA ANALYSIS

In this research, to analyze the risk of fire is using the fishbone analysis method. The risk factor obtained by this method is a factor of whether the hospital policy regarding the fire prevention and management is exist or not. This policy consists of the planning, procurement, placement, and the formulation of fire team or staffs, the type and size, also the maintenance of the fire protection system components both active and passive that is useful for minimizing or managing the danger of fire.

Then it will be reanalyzed regarding the degree of compliance of the fulfillment or the implementation of the policy according to the regulation standard in Indonesia, using the step of plan-do-check-action.

FINDINGS

Overall of the OHS program that has been planned by the management in Surabaya hospital is as much as 89.7% of the 29 aspects observed. According to the level of assessment of fire audit from The Centre of Research and Development (2005), the value of 89.7% is in a good category (>80 - 100%), but from the value of 89.7% on that total fulfillment, more than a half of it is still not yet in accordance with the regulation that is 48,3% (14 aspects), meanwhile the 10% (3 aspects) observed is not available in the hospital.

More than half of the total fulfillment of evaluation at the planning and implementation stage (do), is as much as 48.3% (14 aspects) are available but not in accordance with the regulations. The first aspect including fire extinguisher that in Surabaya Hospital there are only four closed rooms which have fire extinguisher, the other observation rooms only use 3 kg of fire extinguisher which available around the area of each room and we can still find rooms with no fire extinguisher or only have the fire extinguisher sign.

The second aspect is that the fire extinguisher must be examined twice in a year, in Surabaya Hospital there are several fire extinguishers that already had a maintanance checklist sheet for monthly maintenance, but there are still fire extinguisher that has no maintenance checklist sheet.

The third aspect is that fire extinguisher need to be placed on top at 1.2 metre height from the floor surface, except CO_2 and dry flours which can be placed at lower level with a condition that the height of the bottom of fire extinguisher is not less than 15 cm from the floor surface. On this aspect, all fire extinguisher in the hospital are located on average at analtitude of $\pm$ 1 m (100 cm), but also there are fire extinguisher that is placed on the floor. The fourth aspect is the placement of fire extinguisher need to be followed by a sign or symbol. On this aspect, the majority of fire extinguisher placement in the hospital have been followed by a sign or symbol of fire extinguisher.

The fifth aspect is the marking of fire extinguisher symbol must be 125 cm from the floor just above the one or several fire extinguisher. On this aspect, the position of sign/symbol of fire extinguisher in the hospital is varied with an average height of $\pm$ 130 cm. The sixth aspect is the availability of the sprinkler in the room and in the hospital area. On this aspect, the sprinkler was centralized installed on the new hospital building amounted to $\pm$ 24 sprinklers.

The seventh aspect is the installation of fire detector or the fire alarm in hospital area. On this aspect, the detector (smoke detector) only installed in the area of new building of the hospital, and the alarm that is installed in the polyclinic is as many as two and one in front of the Operating room. The eight aspect are the availability of evacuation route in the hospital area. On this aspect, the hospital has 3 exit doors, 1 emergency stair made from oak which will be very vulnerable in case of fire, also 1 ramp made of casted concrete.

Next, the ninth aspect is that all of the exit doors are not blocked. On this aspect, the hospital's exit door is blocked by used stuff from each room, staff's motorcycles and also it is locked. The tenth aspect is that the availability of assembly point, a designated area in the hospital which are to be used in the case of emergency situations. On this aspect, the hospital has 1 assembly point located in front of the main entrance which is a car park so it is not appropriate if that place used as assembly point in the case of fire because it always filled with car every day. The eleventh aspect is that all exit route are clearly visible and marked. For this aspect, almost all the exit marks are made of acrylic, but there are several signs which still usea laminated print and prints have faded so it is not clear when there is an emergency.

The twelfth aspect is the wiring system that must be well organized and in a good condition. On this aspect, almost in all observation areas the electrical wires are found scattered, either from portable or from the installation of electrical connections.In portable condition, almost all of it is not feasible to wear and some are not up to the Indonesia National Standard. The thirteenth aspect is that flammable substances need to be specially placed and labeled with a danger sign. On this aspect, the hospital has boxes made of glass and plastic for storing hazardous and toxic materials and already have the danger sign, but the label that is used for that matter only explains the danger of those materials and about the type and nature of the material is unexplained.

The fourteenth aspect is about the fire team and the structure of its member. On this aspect, the Surabaya

Hospital has the structure of fire management team and for the preparedness and disaster & fire prevention sections are established in the structure of the Hospital OHS Committee, all of which are contained in the Director's Decree. The fire team members are appointed directly from the employees in the area according to the room. Surabaya Hospital does not have a fire prevention experts who is appointed as the person in charge for the technical matter in the case of fire. In the case of fire, the command comes directly from the Director of the hospital as the Disaster Commander of the Hospital along with the fire coordinator led by the head of the disaster & fire coordinator.

Then as much as 10% (3 aspects) of the total fulfillment of evaluations at the stages of planning & implementation, which are not available in the hospital include sprinkler which is examined or supervised periodically. For this aspect, there is no document or checklist of sprinkler checks. The next aspect is fire detectors or fire alarms are tested periodically. In this aspect, there is no document or checklist of inspection results on smoke detectors and fire alarms. The last aspect is that emergency lights are available and functioning well. In this aspect, no emergency lamps are specially used in case of fire.

CONCLUSION

Overall research result indicates that Surabaya Hospital is very at risk of fire. Efforts to minimize the hazards of fire risks, it is expected that the hospitals implement the fulfillment of existing fire protection systems and adjusted to the regulation standards in Indonesia. Then perform the risk management extensively in every area of the hospital.

Conflict of Interest: None

Source of Funding: Self

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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A Review: Uses and Pharmacological Activity of *Matricaria Chamomilla*

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ABSTRACT

M. chamomilla has a branched, erect and smooth stem, which grows to a height of 15–60 cm (6–23.5 in). The long and narrow leaves are bipinnate or tripinnate. The flowers are borne in paniculate flower heads (capitula). The white ray florets are furnished with a ligule, while the disc florets are yellow. The hollow receptacle is swollen and lacks scales. It can be taken as an herbal tea, two teaspoons of dried flower per cup of tea, which should be steeped for 10 to 15 minutes while covered to avoid evaporation of the volatile oils. For a sore stomach, some recommend taking a cup every morning without food for two to three months.

Keyword: *A review, Pharmacological activity, Matricaria chamomilla, Bioactive compounds, Applications.*

INTRODUCTION

Matricaria recutita, commonly known as chamomile (also spelled camomile), Italian camomilla, German chamomile, Hungarian chamomile (kamilla), wild chamomile or scented mayweed, is an annual plant of the composite family Asteraceae [1-7]. *M. chamomilla* is the most popular source of the herbal product chamomile, although other species are also used as chamomile [8-13]. *M. chamomilla* can be found near populated areas all over Europe and temperate Asia, and it has been widely introduced in temperate North America and Australia. It often grows near roads, around landfills, and in cultivated fields as a weed, because the seeds require open soil to survive[14-23]. One of the active ingredients of its essential oil is the terpene bisabolol. Other active ingredients include farnesene, chamazulene, flavonoids (including apigenin, quercetin, patuletin and luteolin) and coumarin [24-32]. Dried chamomile has a reputation (among herbalists) for being incorrectly prepared because it is dried at a temperature above the boiling point of the volatile components of the plant.

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Uses and Pharmacological activity: The flower has been approved for use in baths, as irrigation for anogenital inflammation, and for use internally to treat GI spasms and inflammatory diseases.

Anti-inflammatory: Chamomile has purported anti-inflammatory effects, but there are no published clinical trials supporting the findings of animal experiments [33-37]. Chemical constituents of chamomile, such as bisabolol, chamazulene, and the flavonoids apigenin and luteolin, possess anti-inflammatory properties.

Antispasmodic/antidiarrheal: Chamomile infusions have been used traditionally as GI antispasmodics despite the lack of rigorous trials to support this use. A small trial of a tea containing chamomile and other herbs was effective in treating infantile colic, but the volume of tea required for effect limited its usefulness[38-41].

Skin: Eczema: In a study designed to evaluate the effect of massage with chamomile essential oil versus massage only, no difference was found for the study arms[42-46]. Additionally, further use of the essential oil after the study period showed a decline in eczema severity, suggesting possible sensitization to the oils over time.

Skin: Radiation dermatitis: In a study designed to investigate the efficacy of chamomile cream in acute radiation dermatitis, no difference was found between

chamomile and almond creams. Furthermore, review of the data did not reveal any additional trials; therefore, the use of chamomile cream for this condition is discouraged[47-51].

Estrogenic activity: An ethanolic extract of chamomile containing primarily apigenin demonstrated weak estrogenic and progestational activity in an in vitro tissue system[52-58]. An aqueous extract of chamomile demonstrated antiestrogenic activity on breast cell tissue and demonstrated a nonproliferative effect on cervical cancer cells in a study designed to measure the stimulatory effect of chamomile on bone osteoblasts[58-62].

Mouth (mucositis): Use of chamomile in radiation- and chemotherapy-induced mucositis have been studied in several trials with conflicting results.

Dosage: Chamomile has been used as a tea for various conditions and as a topical cream. Typical oral doses are 9 to 15 g/day[63-69]. Gargles made from 8 g chamomile flowers in 1,000 mL water have been used in trials.

CONCLUSION

This *Matricaria chamomilla* derived bioactive compounds used as source of antibiotic properties and pharmaceutical industries used for drug formulation. *Matricaria chamomilla*, is widely used in the treatment of diabetes, anti-inflammatory effects, and Estrogenic activity.

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Conflict of Interest: None to declare.

Ethical Clearance: In our review, all these major pharmacological activity were complete analysis under the biological department of College of Science for Women in Hillah city.

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Anti-inflammatory Effects and Other Uses of *Cyclamen* Species: A Review

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ABSTRACT

Cyclamen was traditionally classified in the family Primulaceae, was reclassified in the subfamily Myrsinoideae within the family Primulaceae. The aqueous extract obtained from the *Cyclamen europaeum* root-tuber is rich in saponins. These substances are known for their surfactant activity, which means they are adsorbed through the nasal mucosa without being absorbed into the bloodstream. The action of cyclamen extract is local, and it is never absorbed into the bloodstream, so there are no known medication interactions associated with it. This product can be prescribed both as a monotherapy and, if needed, in combined therapy with other medications for treating rhinosinusitis. These include antibiotics, corticosteroids and antihistamines. If use of another nasal spray is required, waiting 2 hours between the two products is recommended. The surfactant action of the *cyclamen saponins* on the nasal mucosa reduces surface tension, facilitating humidification of the zone in addition to the secretion of mucin by goblet cells. This fluidifies the mucous accumulated in the nasal cavity, facilitating its elimination and thereby relieving congestion.

Keyword: *Cyclamen, species, Anti-inflammatory, Bioactive compounds, Applications.*

INTRODUCTION

Cyclamen is Medieval Latin, from earlier Latin cyclamīnos, because of the round tuber. In English, the species of the genus are commonly called by the genus name[1-9]. Is a genus of 23 species of perennial flowering plants in the family Primulaceae[10-26]. Cyclamen species are native to Europe and the Mediterranean Basin east to Iran, with one species in Somalia. They grow from tubers and are valued for their flowers with upswept petals and variably patterned leaves. Species: *Cyclamen africanum, Cyclamen abchasicum, Cyclamen alpinum, Cyclamen balearicum, Cyclamen cilicium, Cyclamen colchicum, Cyclamen confusum, Cyclamen coum,* *Cyclamen creticum, Cyclamen cyprium, Cyclamen elegans, Cyclamen graecum, Cyclamen hederifolium, Cyclamen intaminatum, Cyclamen libanoticum, Cyclamen mirabile, Cyclamen parviflorum, Cyclamen persicum, Cyclamen pseudibericum, Cyclamen purpurascens, Cyclamen repandum, Cyclamen rhodium, Cyclamen rohlfsianum, and Cyclamen somalense.* In many languages[26-34], cyclamen species are colloquially called by a name like the English sowbread, because they are said to be eaten by pigs: pain de pourceau in French, pan porcino in Italian, varkensbrood in Dutch, "pigs' manjū" in Japanese. In addition, the saponins stimulate the sensitive receptors present in the nasal mucosa, inducing a nociceptive response transmitted by the trigeminal nerve[35-42]. The nasal mucosa is entirely innervated by the trigeminal nerve, and therefore the cholinergic response generated in the nasal cavity is observed throughout the nasal mucosa, favouring opening of the ostium, increasing glandular secretions and increasing ciliar movement in the entire area[43-50]. The accumulated secretions in the sinuses are consequently drained through the nose, providing rapid symptomatic relief of nasal congestion[51].

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Anti-inflammatory effects of cyclamen: Cyclamens are plants native to an area of southern Europe, northern Africa and western Asia bordering the Mediterranean sea. The Cyclamen genus comprises around 20 species, the most familiar being purpurascens, widely cultivated as a houseplant for its showy, dark green leaves flecked with silver, and nodding white, pink or red flowers with their familiar, reflexed petals[52-55]. In medieval times cyclamen retained its plethora of uses, but became used increasingly in the treatment of rheumatic and arthritic conditions. Recent research has focused on reported anti-inflammatory and antinociceptive effects of cyclamen extracts. The roots contain triterpene glycosides known as saponins and researchers at the University of Padua in Italy have found that extracts of the tubers of *Cyclamen repandum* show promising activity when tested on rats and mice[56-60]. The researchers have isolated and identified the various glycosides and have carried out further in vitro studies measuring the anti-inflammatory properties of cyclamen extracts. They concentrated particularly upon the activity of a newly isolated saponin called repandoside[61-63]. Results showed that repandoside is one of several saponins that did indeed mediate the inflammatory response by influencing the behaviour of human macrophages. It is hoped that these compounds can be developed for future use in the treatment of inflammatory conditions[64].

CONCLUSION

Cyclamen, is widely used in the anti-inflammatory and antinociceptive effects. *Cyclamen* derived bioactive compounds used as source of antibiotic properties and pharmaceutical industries used for drug formulation.

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Pharmacological Activities: Hepatoprotective, Cardio Protective, Anti-cancer and Anti-Microbial Activity of (*Raphanus Raphanistrum* Subsp. *Sativus*): A Review

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ABSTRACT

The radish (*Raphanus raphanistrum* subsp. sativus) is an edible root vegetable of the Brassicaceae family that was domesticated in Europe in pre-Roman times. The root is best harvested before the plant flowers. Its use is not recommended if the stomach or intestines are inflamed. The leaves, seeds and old roots are used in the treatment of asthma and other chest complaints. The juice of the fresh leaves is diuretic and laxative. The seed is carminative, diuretic, expectorant, laxative and stomachic. It is taken internally in the treatment of, abdominal bloating, wind, acid regurgitation, diarrhea and bronchitis. The root is antiscorbutic, antispasmodic, astringent, cholagogue, and diuretic. Antimicrobial proteins and peptides in plants have most commonly been discovered in seeds where they accumulate to high level and may also function as storage proteins. The crude water extract of seed inhibited moderate antifungal activity while showed highest antibacterial activity against *Hafnia alvei* and *Enterobacter agglomerans* exhibited. It has been observed that rude water extract posses highest antibacterial activity. Crude water extract showed significant inhibition against some fungal strain like *Spadicoides stoveri* and *Paecilomyces variotii* while some fungal strain having insignificant inhibition.

Keyword: *Hepatoprotective, Anti-cancer, anti-microbial, Raphanus raphanistrum, Review.*

INTRODUCTION

Radishes are grown and consumed throughout the world, being mostly eaten raw as a crunchy salad vegetable. Radishes have long been grown as a food crop, but they also have various medicinal actions. The plant is used in the treatment of intestinal parasites, though the part of the plant used is not specified[1-8]. They have numerous varieties, varying in size, flavor, color, and length of time they take to mature. Radishes owe their sharp flavor to the various chemical compounds produced by the plants, including glucosinolate, myrosinase, and isothiocyanate. They are sometimes grown as companion plants and suffer from few pests and diseases[9-19]. It is crushed and used as a poultice for burns, bruises and smelly feet. Radishes are also an excellent food remedy for stone, gravel and scorbutic conditions. The plant contains raphanin, which is antibacterial and antifungal[20-25]. It inhibits the growth of Staphylococcus\ aureus, *E. coli*, *streptococci*, *Pneumococci* etc. Radish preparations are useful in liver and gall bladder troubles. Consuming radish generally results in improved digestion, but some people are sensitive to its acridity and robust action[26-31]. The plant also shows anti-tumor activity.

PHARMACOLOGICAL ACTIVITIES

Hepatoprotective activity: It is reported that the methonolic extract of leaves of Raphanus sativus active against paracetamol induced hepato toxicity. Paracetamol increed the activity of hepatic enzymes like SGOT, SGPT, serum LDH, serum AP. An antioxidant is a molecule capable of slowing or preventing the oxidation of other molecules. Oxidation reactions can produce

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free radicals, which start chain reactions that damage cells[32-36]. Antioxidant defenses fall in to two main categories, those whose role is to prevent the generation of free radicals and those that intercept any radicals that are generated.

Cardio protective activity: The chronic cardio toxicity may result from summation of multiple biochemical pathways of cellular damage, which ultimately yields distruption of myocardiocyte integrity and loss of cardiac function. Nitricoxide (NO) is a key molecule involved in the pathophysiology of heart; disregulation of activity of nitric oxide synthases (NOSs) and of NO metabolism seems to be a common feature in cardiac diseases[37-41]. Hence uric acid may serves as an additional marker of free radical reactions in patients with acute myocardial infarction and acute coronary insufficiency.

Anti-cancer and anti-microbial activity: Anti-cancer and anti-microbial activity of methonolic extract of leaves of *Raphanus sativus* was reported. Insoluble ethyl acetate fraction from methanol extract was the most active against *A. salina*. On the other hand, the soluble ethyl acetate fraction from methanol extract exhibited strong inhibitory activity against *S. aureus*.

Anti-microbial activity: The plant contains raphanin, which is antibacterial and antifungal15. It also has been found to be strongly active *Escherichia coli*, *Pseudomonas pyocyaneus*, Salmonella typhi and Bacillus subtilisetc[42-48]. It inhibits the growth of *Staphylococcus aureus*, *streptococci*, *Pneumococci*. It is also active against many food born pathogenic and food spoilage bacteria such as *Listeria*, *Micrococcus*, *Enterococcus*, *Lactobacillus* and *Pedicoccusspps*.

Inhibitory response on lipid peroxidation: Free radicals are continuously produced in body of all living organisms mainly due to oxidation processes. Antioxidant system of the body is generally able to combat the oxidative stress produced after normal physiological processes. Modern civilization is facing a variety of mental and physical stress, pollutant stress, stress caused by consuming fast food, etc[49-51]. These stresses culminate into generation of free radicals and the antioxidant system of body fails to combat this situation. Oxidation of lipid molecules of membrane causes its damage resulting into the development of several physiological and pathological disorders. Inhibition of lipid peroxidation by any means is the best way to avoid these disorders in the body. It was reported that the plant inhibits lipid peroxidation by increasing the activity of enzymatic antioxidants like catalase and also by increasing or maintaining the levels of glutathione.

Antiurolithiatic activity: The aqueous extract of the bark of *Raphanus sativus* was tested for its antiurolithiatic and diuretic activity. The urolithiasis was experimentally induced by implantation of zinc disc in the urinary bladder of rats. Significant decrease in the weight of stones was observed after treatment in animals which received aqueous extract in comparison with control groups.

Anti tyrosinase and anti-oxidant activity: Two different types of *R. sativus* L. root extracts, i.e., the freeze-dried juice and the methanolic extract were evaluated for their inhibitory effect on mushroom tyrosinase and their scavenging activity on DPPH, superoxide anion and singlet oxygen. The methanolic extract of the radish sprout exhibited hydroxyl radical scavenging potency 1.8-fold higher than that of L-ascorbic acid. It is suggested that flavonoids, together with sinapinic acid esters, may significantly contribute to the antioxidant activity of radish roots andsprouts. Also, black radish, which is a variety of *R. sativus*, possesses antioxidant and free radical scavenging properties[52-54]. It is very likely that the Thai radish roots may possess significant antityrosinase and antioxidant activities which will have beneficial effects on the skin.

Gastro protective activity: The radish juice possesses an antigastric ulcer effect, being presumably attributed to its phenolic, terpenoidal and sulphurated constituents through preventing the accumulation of excessive free radicals and protecting the gastric tissue against noxious chemical challenges. This may be related to its PG generating, antioxidant and/or preserving mucus secreting properties and by strengthening the mucosal barrier integrity, which is the first line of defense against endogenous and exogenous ulcerogenic agents.

CONCLUSION

Plant medicinal properties of *Raphanus raphanistrum* is due to presence of bioactive chemical products. *Raphanus raphanistrum*, is widely used in the treatment of antiurolithiatic, diuretic activity, anti-cancer and anti-microbial activity.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: In our review, all these major pharmacological activity were complete analysis under the biological department of College of Science for Women in Hillah city.

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Assessment of Mothers' Attitude toward Chemotherapy Treatment for Pediatric in Oncology Units Hospital Margin in Babylon City

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ABSTRACT

Cancer is leading cause of death worldwide, whereby more than 10 million people are diagnosed with cancer and 6 million deaths take place annually It has been estimated that there will be 15 million new cases every year by 2020 The current data on cancer incidence is not available due to unavailability of regular cancer registry system at national level. profound psychosocial and existential distress Along with technical expertise for ensuring safe admini-stration of treatment, nurses have to demonstrate a high level positive attitude to help cancer patients in their psychological issues due to chemotherapy the study aims to assess the level of mother's attitude toward chemotherapy treatment for children with cancer, to assess the level of mother's attitude according to sociodemographic characteristics, methodology study was conducted in oncology margin   Hospital. these units provide chemotherapy treatment for children which suffering from cancer, sample of the study a non-probability (purposive) samples of (100) mothers who have child suffering from cancer and undergoing chemotherapy , reliability of the instrument pilot study was carried out between October 10th to March 20th 2017. On (6) mothers by the researcher statistical data analysis appropriate statistical approach Spss was used that includes descriptive statistics (frequency, percentage), recommendations and suggestions

The study comes up with the following recommendations establishing new standard programs suitable for mothers to increase knowledge and attitude concerning chemotherapy procedures in Iraq depending on international standard programs and upon the result of this study. The study recommends continuous educational program for mothers to develop and modify their attitude regarding care of their children undergoing chemotherapy Special training programs should be designed and constructed for mothers in this area to reinforce and promote their experiences toward chemotherapy.

Keywords: Mothers, attitude, Chemotherapy, pediatric, Oncology.

INTRODUCTION

Cancer is leading cause of death worldwide, whereby more than 10 million people are diagnosed with cancer and 6 million deaths take place annually[1]. It has been estimated that there will be 15 million new cases every year by 2020 [2]. The current data on cancer incidence is not available due to unavailability of regular cancer registry system at national level. Profound psychosocial and existential distress [3]. Along with technical expertise for ensuring safe administration of treatment, nurses have to demonstrate a high level positive attitude to help cancer patients in their psychological issues due to chemotherapy. Attitude is the underlying way we think, feel, act, and react to the world around us [4]. Attitude includes manner and the mind set in which one approaches care; it encompasses the essence of caring, interpersonal communication, individual uniqueness, and respect for humanity. It is observed that in majority of the oncology administered by oncology nurses along with the management of its side effects if patient have. So nurses are being responsible for complete the whole

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process of chemotherapy. Hence, there is a great need to assess the knowledge, skill and attitude of oncology nurses in marjan to en-sure the safe care in chemotherapy administration of cancer patients. Therefore, this study was conducted to assess the oncology nurses' existing level of knowledge, skills and attitude regarding chemotherapy administration.

MATERIAL AND METHOD

Design of the study: Quantitative design (a descriptive study) was carried out to achieve the purpose of the study.

Setting of the study: The study was conducted in oncology margan Hospital. These units provide chemotherapy treatment for children which suffering from cancer. Sample of the study: A non-probability (purposive) samples of (100) mothers who have child suffering from cancer and undergoing chemotherapy.

Instrument construction: In order to assess nurses' attitudes, a constructed questionnaire was design and means of an interview technique with the mothers was constructed to measure the variables underlying study (appendix A). A questionnaire based on comprehensive review of relevant literature and previous studies was also used. These instruments consist of two parts namely: the demographic data of the mothers, child and child's illness.

Demographic Date Sheet: Part one concerned with personal information includes, the nurses (mothers' educational level, mother's occupation, residency, monthly income, duration of receiving chemotherapy, and duration of illness).

Mothers' attitude: Part two contained of (20) items concerning mothers' attitude regarding chemotherapy treatment. These questions includes positive and negative attitude .The questionnaires were answered by one of these answers (agree and disagree).

Validity of the instrument: Constant validity determined for questionnaire through the use of panel experts who are faculty members from College of Nursing. The experts were asked to review the questionnaires for content with clarity. Such changes were employed according to their suggestions and valuable comments.

Reliability of the instrument: Pilot study was carried out between October 10 to March 20th 2017. On (6) mothers by the researcher and tested questionnaire were performed for determination of the instrument reliability level. The results indicated that the correlation coefficient was r = 0.88.

Data collection: The data collected with constructed questionnaire through an application of direct interview as mean of data collection.

Statistical data analysis: Appropriate statistical approach was used that includes descriptive statistics (frequency, percentage).

Limitation of the study: One of the biggest problems faced the researchers is the few of the studies that deal with this subject especially in nearby countries.

Table 1: Socio-demographic characteristics.

List	Variables	Frequency	Percent	List	Variables	Frequency	Percent
1.	**Mothers age**			5.	**Resideny**		
	20 – 30	58	0.58		Urban	59	0.59
	31 -40	26	0.26		Ritral	41	0.41
	41and above	16	0.16		Total	100	%100
	Total	100	%100	6.	**Type of family**		
2.	**Monthly income**				Nuclear	51	0.51
	Insufficient	52	0.52		Extended	49	0.49
	Sufficient	48	0.48		Total	100	%100
	Total	100	%100				
3.	**Educational qualification**			7.	**Duration of receiving chemotherapy (YEARS)**		
	Illiterate	31	0.31		<1	58	0.58
	High school and less	53	0.53		2 -3 Y	37	0.37
	Institute and above	16	0.16		4Y and above	5	0.05
	Total	100	%100		Total	100	%100

Contd…

4.	Mother's Occupation			8.	Duration of illness(Years)		
	Employee	19	0.19		<1	58	0.58
	Un employee	78	0.78		2 – 3 Y	37	0.37
	Retired	3	0.03		4Yand above	5	0.05
	Total	100	%100		Total	100	%100

Table 2: Characteristics of families

Variables	Low	Intermediate	High	Total
Type of family				
Nuclear	10	27	14	51
Extended	16	25	8	49
Total	26	52	22	100
Type of education				
Illiteracy	12	14	5	31
High School and Less	12	29	12	53
Attitue and Above	2	9	5	16
Total	26	52	22	100
Employee	6	7	6	19
Un Employed	19	44	15	78
Retired	1	1	1	3
Total	26	52	22	100
Less than 1	16	31	14	61
2-3	9	19	8	36
4 and above	1	2	0	3
Total	26	52	22	100

Table 3: Total participants, attitude toward children undergoing

Duration and receiving Chemotherapy	Low	Intermediate	High	Total
Less than 1y	16	31	14	61
2- 3 y	9	19	8	36
4and more	1	2	0	3
Total	26	52	22	100
Less than 1y	18	27	13	58
2- 3 y	7	21	9	37
4and more	1	4	0	5
Total	26	52	22	100
Urban	20	44	20	84
Rural	6	8	2	16
Total	26	52	22	100

RESULTS

Table (1) described that more than half (58%) of the study participants (mothers) are within the 31-40 years old-age group, more than the half (52%) of them have insufficient monthly income ,the majority of them are high school and less graduate (53%), the majority of them (78%) un employee, the majority of them live in urban areas (84%),about (51%) of them nuclear family , more than half (61%) of these children have received chemotherapy for less than one year, and more than half of them have less than one year as a duration of illness (58%).decuses that the high percent (58%) (20 − 30) years the Low percent (5%) (41 and above. **Table (2)** this table showed that high percentage of attitude (intermediate) is within the 21- 30 years old – age group (34%) , nuclear family (27%) , high school and less graduate(29%) , insufficient monthly income (30%) unemployed (44%) , children have received   chemotherapy for less than one years (31%) . less than one years as aduration of illness (29%) and urbarn residency (44%)   dicuss high present Urbo 44% intermediate low present 2% high . **Table (3)**: implicates that name than the half of the study participants have intermediate attitude toward child under chemotherapy (52.0)%

DISCUSSION

Table (1) demographic Characteristics described that show others highest value Mothers age(20 –30) less value 41and above agreement references [2] , Monthly income highest value Insufficient(52) less value Sufficient(48) agreement references [2], Educational qualification highest value High school and less (53) less value Institute and above(16), Mother's Occupation highest value Un employee(78) less value Retired (16) agreement references [2], Resideny highest value Urban (48) less value Ritral (16) agreement references [3] Type of family highest value Nuclea (51) less value Extended (48) agreement references [3] , Duration of receiving chemotherapy(YEARS) highest value<1 (58) less value 4Y and above (5) agreement references [2]. Duration of illness (Years) <1 highest value (58) less value than4Yand above (5) agreement references [2]. Table (2): this table showed that high percentage of attitude (intermediate) is within the 21- 30 years old – age group (34%) , nuclear family (27%) , high school and less graduate(29%) agreement references [2]   , insufficient monthly income (30%) unemployed (44%) agreement references [3]   ,

children have received   chemotherapy for less than one years (31%) agreement references [2] . less than one years as aduration of illness (29%) and urbarn residency (44%) dicuss high present Urbo 44% intermediate low present 2% high agreement references [8]. Table (3): implicates that name than the half of the study participants have intermediate attitude toward child under chemotherapy (52.0)% agreement references[4-8].

CONCLUSION

Chemotherapy still dilemma to the children with cancer and their parent and one of most common factors effect on choosing treatment is the parent attitude. Parent with positive or high attitude become more positive coping behaviors and more adjustment with disease. This study concluded that more than half of mothers have intermediate attitude. The study comes up with the following recommendations: Establishing new standard programs suitable for mothers to increase knowledge and attitude concerning chemotherapy procedures in Iraq depending on international standard programs and upon the result of this study. The study recommends continuous educational program for mothers to develop and modify their attitude regarding care of their children undergoing chemotherapy. Special training programs should be designed and constructed for mothers in this area to reinforce and promote their experiences toward chemotherapy.

Conflict of Interest: None to declare.

Ethical Clearance: In this research, all experimental protocols were approved under the Emergency Department of Hillah Teaching Hospital of Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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Matricaria chamonbmilla: Bioactive Compounds of Methanolic Fruit Extract Using GC-MS and FTIR Techniques and Determination of its Antimicrobial Properties

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ABSTRACT

Matricaria chamomilla is the most popular source of the herbal product chamomile, although other species are also used as chamomile. The objectives of our study were analysis of the secondary metabolite products. Nineteen bioactive compounds were identified in the methanolic extract of *Matricaria chamomilla*. The identification of bioactive chemical compounds is based on the peak area, retention time molecular weight and molecular formula. GC-MS analysis of *Matricaria chamomilla* revealed the existence of the 4-Amino-1,5-pentandioic acid , (R)-lavandulyl acetate , 1,3-Diazacyclooctane-2-thione , Glucosamine , N-acetyl-N-benzoyl- , Trans – Traumatic acid , Dodecanoic acid , 3-hydroxy- , Cyclopentanone , 2-cyclopentylidene- , (E)-β-Famesene , 1-Naphthalenol , 2-methyl- , Pregn-4-ene,3,20-dione ,17,21-dihydroxy-,bis(O-methyloxime) , 9,12,15-Octadecatrienoic acid ,2,3-dihydroxypropyl ester , (Z) , Pyrazole[4,5-b]imidazole,1-formyl-3-ethyl-6-β-d-ribofuranosyl- , 1,6-Dioxaspiro[4. 4]non-3-ene,2-(2,4-hexadiynylidene)- , 9,12-Octadecadienoic acid (Z,Z)- , 9-Octadecenamide,(Z)- , 1,2-Benzenedicarboxylic acid , bis(8-methylnonyl) ester , Carda-4,20(22)-dienolide , 3-[(6-deoxy-3-O-methyl-α-D-allopyra and Campesterol. Maximum zone formation was against *Proteus mirabilis* 6.01±0.23. *Matricaria chamomilla* was very highly active against *Aspergillus terreus* 5.89±0.24.

Keywords: *Matricaria chamomilla, Bioactive compounds, Antimicrobial, Methanol, Fruit, GC-MS.*

INTRODUCTION

Matricaria chamomilla has a branched, erect and smooth stem, which grows to a height of 15–60 cm (6–23.5 in)[1]. The long and narrow leaves are bipinnate or tripinnate. The flowers are borne in paniculate flower heads (capitula). The white ray florets are furnished with a ligule, while the disc florets are yellow [2-7]. The hollow receptacle is swollen and lacks scales. It can be taken as an herbal tea, two teaspoons of dried flower per cup of tea, which should be steeped for 10 to 15 minutes while covered to avoid evaporation of the volatile oils. For a sore stomach, some recommend taking a cup every morning without food for two to three months[8-13]. *M. chamomilla* can be found near populated areas all over Europe and temperate Asia, and it has been widely introduced in temperate North America and Australia[8-31]. It often grows near roads, around landfills, and in cultivated fields as a weed, because the seeds require open soil to survive. One of the active ingredients of its essential oil is the terpene bisabolol [14-27]. Other active ingredients include farnesene, chamazulene, flavonoids (including apigenin, quercetin, patuletin and luteolin) and coumarin[28-37]. Dried chamomile has a reputation (among herbalists) for being incorrectly prepared because it is dried at a temperature above the boiling point of the volatile components of the plant [38-39]. The aims of this study were analysis of the secondary metabolite products and evaluation of its antibacterial and antifungal activities.

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MATERIAL AND METHOD

Gas chromatography–Mass Spectrum: *Matricaria chamomilla* GC–MS analysis were carried out in a GC system (Agilent 7890A series, USA). 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)[40].

Fourier transform infrared spectrophotometer (FTIR): The powdered *Matricaria chamomilla* was treated for Fourier transform infrared spectrophotometer (Shimadzu, IR Affinity 1, Japan). The sample was run at infrared region between 400 nm and 4000 nm[41].

Determination of antibacterial and antifungal activity of crude bioactive compounds of *Matricaria chamomilla*: The test bacterial pathogens were swabbed in Müller-Hinton agar plates. Sixteen μL of *Matricaria chamomilla* extract was loaded on the bored wells. The wells were bored in 0.5 cm in diameter [42]. The plates were incubated at 37ºC for 24 h and examined. After the incubation the diameter of inhibition zones around the discs was measured. Five-millimeter diameter wells were cut from the agar using a sterile cork-borer, and fifty *μl* of the samples solutions *Matricaria chamomilla* was delivered into the wells. 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. The tests were carried out in triplicate. The antifungal activity was evaluated by measuring the inhibition-zone diameter observed after 48 h of incubation[43-46].

Statistical analysis: 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.

Table 1: Major phytochemical compounds identified in methanolic extract of *Matricaria chamomilla*

S. No.	Phytochemical compound	RT (min)	Molecular Weight	Exact Mass	Pharmacological actions
1.	4-Amino-1,5-pentandioic acid	4.185	175	175.084458	*anti-**proliferative** activity*
2.	(R)-lavandulyl acetate	4.472	196	196.14633	***antioxidant** activity*
3.	1,3-Diazacyclooctane-2-thione	5.576	144	144.07212	Unknown
4.	Glucosamine , N-acetyl-N-benzoyl-	5.851	325	325.116152	Unknown
5.	Trans – Traumatic acid	6.182	228	228.136159	*anti-**hyperalgesic***
6.	Dodecanoic acid , 3-hydroxy-	7.338	216	216.1725445	*anti-**HIV** activity*
7.	Cyclopentanone , 2-cyclopentylidene-	7.951	150	150.1044655	*anti-**inflammatory** activity*
8.	(E)-β-Famesene	8.374	204	204.1878	*Anti-**Infective***
9.	1-Naphthalenol , 2-methyl-	8.443	158	158.073165	*anti-**inflammatory***
10.	Pregn-4-ene,3,20-dione ,17,21-dihydroxy-,bis(O-methyloxime)	10.153	404	404.267508	*anti-**inflammatory** activity*
11.	9,12,15-Octadecatrienoic acid ,2,3-dihydroxypropyl ester , (Z)	10.972	352	352.26136	***antiviral** and anti-**obesity** properties*
12.	Pyrazole[4,5-b]imidazole,1-formyl-3-ethyl-6-β-d-ribofuranosyl-	12.002	296	296.11207	*anti-**pain compound***
13.	1,6-Dioxaspiro[4.4]non-3-ene,2-(2,4-hexadiynylidene)-	12.980	200	200.08373	*anti-**inflammatory, analgesic, antipyretic***
14.	9,12-Octadecadienoic acid (Z,Z)-	15.406	280	280.24023	*anti-**inflammatory***
15.	9-Octadecenamide,(Z)-	17.317	281	281.271864	*anti-**inflammatory antibacterial** activity*

Contd…

16.	1,2-Benzenedicarboxylic acid , bis(8-methylnonyl) ester	21.391	446	446.33961	*anti-**inflammatory***
17.	Carda-4,20(22)-dienolide , 3-[(6-deoxy-3-O-methyl-α-D-allopyra	22.158	548	548.298534	***antibacterial*** *activity*
18.	Campesterol	23.531	400	400.370516	*anti-**inflammatory** activity*

RESULTS AND DISCUSSION

Identification of biochemical compounds: Analysis of compounds was carried out in methanolic extract of *Matricaria chamomilla*, shown in **Table 1.** Chromatogram GC-MS analysis of the methanol extract of *Matricaria chamomilla* showed the presence of thirty one major peaks and the components corresponding to the peaks were determined as follows. All peaks were determined to be 4-Amino-1,5-pentandioic acid , (R)-lavandulyl acetate , 1,3-Diazacyclooctane-2-thione , Glucosamine , N-acetyl-N-benzoyl- , Trans – Traumatic acid , Dodecanoic acid , 3-hydroxy- , Cyclopentanone , 2-cyclopentylidene- , (E)-β-Famesene , 1-Naphthalenol , 2-methyl- , Pregn-4-ene,3,20-dione ,17,21-dihydroxy-,bis(O-methyloxime) , 9,12,15-Octadecatrienoic acid,2,3-dihydroxypropyl ester , (Z) , Pyrazole[4,5-b]imidazole,1-formyl-3-ethyl-6-β-d-ribofuranosyl-, 1,6-Dioxaspiro[4.4]non-3-ene,2-(2,4-hexadiynylidene)-, 9,12-Octadecadienoic acid (Z,Z)-, 9-Octadecenamide,(Z)- , 1,2-Benzenedicarboxylic acid, bis(8-methylnonyl) ester , Carda-4,20(22)-dienolide, 3-[(6-deoxy-3-O-methyl-α-D-allopyra and Campesterol. The FTIR analysis of *Matricaria chamomilla* leaves proved the presence of alkyl halides, alkenes, Amide, alkanes, and aldyhides which shows major peaks at 667.37, 756.10, 869.90, 889.18**,** 947.05**,** 1018.41**,** 1091.71**,** 1190.08**,** 1199.72, 1317.38, 1608.63, 1721.65**,** 1732.08, 2330.01, 2358.94, 2461.17, 2820.28, 2904.80 and 2929.87. In our research, the anti-microbial activity of *Matricaria chamomilla* extract was determinate by determining the zone of inhibition against eight bacteria and eight fungi and yeast. Clinical pathogens were selected for antibacterial activity namely, *Streptococcus pneumonia*, *Pseudomonas eurogenosa*, *Salmonella typhi*, *Staphylococcus epidermidis*, *Bacillus subtilis, Escherichia coli*, *Proteus mirabilis*, and *Streptococcus pyogenes*. Maximum zone formation was against *Proteus mirabilis* 6.01±0.23. Methanolic extraction of *Matricaria chamomilla* showed notable antifungal activities against *Trichoderma horzianum*, *Candida albicans*, *Aspergillus niger*, *Aspergillus terreus*, *Saccharomyces cerevisiae*, *Microsporum canis*, *Trichoderma viride,* and *Penicillium expansum. Matricaria chamomilla* was very highly active against *Aspergillus terreus* 5.89±0.24. In comparison to the antibiotics used in this study, the plants extracts were far more active against the test bacterial strains[47].

CONCLUSION

Medicinal property of *Matricaria chamomilla* methanolic extract is due to presence of secondary metabolites. Eleven bioactive chemical compounds were identified by GC-MS analysis. This *Matricaria chamomilla* derived bioactive compounds used as source of antibiotic properties and pharmaceutical industries used for drug formulation.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All our protocols were approved under the Department of Biology, College of Science for women, University of Babylon, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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Analysis of Methanolic Extract of *Fusarium Chlamydosporum* Using GC-MS Technique and Evaluation of its Antimicrobial Activity

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ABSTRACT

Chromatography is the term used to describe a separation technique in which a mobile phase carrying a mixture is caused to move in contact with a selectively absorbent stationary phase. The objectives of this study were analysis of the secondary metabolite products and evaluation antimicrobial activity. Bioactives are chemical compounds often referred to as secondary metabolites. Eleven bioactive compounds were identified in the methanolic extract of *Fusarium chlamydosporum*. DL-Arabinose, D-Glucose , 6-O-α-D-galactopyranosyl, α-D-Glucopyranoside , O-α-D-glucopyranosyl, 5-Hydroxymethylfurfural, N-(4,6-Dimethyl-2-pyrimidinyl)-4-(4-nitrobenzylidenea, 1H-Purin-2-amine , 6-methoxy-N-methyl, 2-Methyl-9-β-d-ribofuranosylhypoxanthine, 1-Hexadecanesulfonic acid , 3,5,-dichloro-2,6-dimeth, Methyl-6,7-benzoisoquinoline, Undeca -2,4,6,8,10-pentaenal , 11-(2-furyl)-,oxime, and 2-Bromotetradecanoic acid. *Malva sylvestris* was very highly active 6.85±0.25 mm. The results of anti-fungal and anti-bacterial activity produced by *Fusarium chlamydosporum* showed that the volatile compounds were highly effective to suppress the growth of *Aspergillus terreus* (6.09±0.21) and *Staphylococcus aureus* (5.99±0.19) mm.

Keywords: *Anti-Microbial, Fusarium chlamydosporum, GC-MS, Secondary metabolites.*

INTRODUCTION

Fusarium commonly infects barley if there is rain late in the season. It is of economic impact to the malting and brewing industries, as well as feed barley. *Fusarium* contamination in barley can result in head blight, and in extreme contaminations, the barley can appear pink[1-7]. Most species are harmless saprobes, and are relatively abundant members of the soil microbial community. The genus includes a number of economically important plant pathogenic species. *Fusarium oxysporum* f.sp. cubense is a fungal plant pathogen that causes Panama disease of banana (Musa spp.), also known as fusarium wilt of banana[8-15]. Panama disease affects a wide range of banana cultivars, which are propagated asexually from offshoots and therefore have very little genetic diversity. In humans with normal immune systems, fusarial infections may occur in the nails (onychomycosis) and in the cornea (keratomycosis or mycotic keratitis). Some consumers of *fusarium* products have shown food allergies similar in nature to peanut and other food allergies. People with known sensitivities to molds should exercise caution when consuming such products. *Fusarium* species possess several virulence factors, including the ability to produce mycotoxins, including trichothecenes, which suppress humoral and cellular immunity and may also cause tissue breakdown[16-27]. In addition, *Fusarium* species have the ability to adhere to prosthetic material and to produce proteases and collagenases[17-32]. The aims of this research were screening of secondary bioactive chemical products and determination of its antibacterial and antifungal activities.

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MATERIAL AND METHOD

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[33-39]. The spectrum of the extract was matched with the spectrum of the known components stored in the NIST library[40-43].

Analysis of methanolic extract of *Fusarium chlamydosporum* and evaluation of its antimicrobial activity: *Fusarium chlamydosporum* spores were grown in a liquid culture of potato dextrose broth (PDB) and incubated at 25ºC in a shaker for sixteen days at 150 rpm. The extraction was performed by adding 50 ml methanol to 150 ml liquid culture in an Erlenmeyer flask after the infiltration of the culture[44-47]. The test pathogens were swabbed in Muller Hinton agar plates. 90μl of fungal extracts was loaded on the bored wells. The wells were bored in 0.5cm in diameter[48-50]. The plates were incubated at 37C° for 24 hr and examined. After the incubation the diameter of inhibition zones around the discs was measured. 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[51-53]. The tests were carried out in triplicate. The antifungal activity was evaluated by measuring the inhibition-zone diameter observed after 48 h of incubation.

Statistical Analysis: 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.

Table 1: Major phytochemical compounds identified in methanolic extract of *Fusarium chlamydosporum*

S. No.	Phytochemical compound	RT (min)	Molecular Weight	Exact Mass
1.	DL-Arabinose	3.230	150.052823	150
2.	D-Glucose , 6-O-α-D-galactopyranosyl-	3.642	342.11621	342
3.	α-D-Glucopyranoside , O-α-D-glucopyranosyl-(1.fw	4.929	504.169035	504
4.	5-Hydroxymethylfurfural	6.440	126.031694	126
5.	N-(4,6-Dimethyl-2-pyrimidinyl)-4-(4-nitrobenzylidenea	7.756	411.100124	411
6.	1H-Purin-2-amine , 6-methoxy-N-methyl-	10.949	179.080709	179
7.	2-Methyl-9-β-d-ribofuranosylhypoxanthine	11.527	282.09642	282
8.	1-Hexadecanesulfonic acid , 3,5,-dichloro-2,6-dimeth	14.897	479.20277	479
9.	3-Methyl-6,7-benzoisoquinoline	14.931	193.089149	193
10.	Undeca -2,4,6,8,10-pentaenal , 11-(2-furyl)-,oxime	16.637	241.110279	241
11.	2-Bromotetradecanoic acid	17.392	306.119442	306

Table 2: Zone of inhibition (mm) of test different bioactive compounds and standard antibiotics of medicinal plants to *Fusarium chlamydosporum*

S. No.	Plant	Inhibition (mm)
1.	*Datura stramonium*	3.50 ± 0.20
2.	*Diplotaxis cespitosa*	6.10 ± 0.23
3.	*Cassia angustifolia*	5.62 ± 0.23
4.	*Rosmarinus oficinalis*	5.45 ± 0.22
5.	*Citrullus colocynthis*	3.89 ± 0.16
6.	*Althaea rosea*	5.85 ± 0.21
7.	*Coriandrum sativum*	6.77 ± 0.25
8.	*Origanum vulgare*	5.59 ± 0.24
9.	Urtica dioica	4.08 ± 0.21
10.	*Foeniculum vulgare*	3.09 ± 0.18
11.	*Medicago sativa*	3.09 ± 0.18
12.	*Celosia argentea*	3.56 ± 0.20
13.	Apium graveolens	5.08 ± 0.21
14.	Brassica rapa	6.08 ± 0.23
15.	Cichorium endivia	5.73 ± 0.23

Contd…

16.	Anethum graveolens	5.99 ± 0.23
17.	*Malva sylvestris*	6.85 ± 0.25
18.	*Malva parviflora*	3.51 ± 0.19
19.	*Daucus carota*	6.11 ± 0.25
20.	*Vitex agnus-castus*	5.73 ± 0.24
21.	*Citrus sinensis*	5.69 ± 0.14
22.	*Ruta graveolens*	3.90 ± 0.18
23.	*Thymus vulgaris*	5.64 ± 0.20
24.	*Passiflora caerulea*	6.76 ± 0.25
25.	*Glycine max*	5.78 ± 0.23
26.	*Brassica oleracea*	4.08 ± 0.21
27.	*Olea europaea*	3.03 ± 0.18
28.	*Borago officinalis*	3.37 ± 0.20
29.	*Sambucus nigra*	5.06 ± 0.22
30.	*C. morifolium*	6.05 ± 0.23
31.	*Equisetum arvense*	5.66 ± 0.23
32.	*Portulaca oleracea*	5.99 ± 0.24
33.	*Malva neglecta*	5.48 ± 0.22
34.	Control	0.00

RESULTS AND DISCUSSION

Analysis of compounds was carried out in methanolic extract of *Fusarium chlamydosporum*, shown in **Table 1.** Chromatogram GC-MS analysis of the methanol extract of *Fusarium chlamydosporum* showed the presence of thirty one major peaks and the components corresponding to the peaks were determined as follows. All peaks were determined to be DL-Arabinose, D-Glucose, 6-O-α-D-galactopyranosyl, α-D-Glucopyranoside, O-α-D-glucopyranosyl, 5-Hydroxymethylfurfural, N-(4,6-Dimethyl-2-pyrimidinyl)-4-(4-nitrobenzylidenea, 1H-Purin-2-amine, 6-methoxy-N-methyl, 2-Methyl-9-β-d-ribofuranosylhypoxanthine, 1-Hexadecanesulfonic acid, 3,5,-dichloro-2,6-dimeth, Methyl-6,7-benzoisoquinoline, Undeca -2,4,6,8,10-pentaenal , 11-(2-furyl)-,oxime, and 2-Bromotetradecanoic acid. Clinical microorganism selected for antibacterial activity namely, *Bacillus subtilis*, *Pseudomonas eurogenosa*, *Staphylococcus epidermidis*, *Escherichia coli*, *Proteus mirabilis, Streptococcus pyogenes*, *Staphylococcus aureus*, and *Klebsiella pneumonia,* maximum zone formation against *Staphylococcus aureus* (5.99±0.19)mm. Methanolic extraction of *Fusarium chlamydosporum* showed notable antifungal activities against *Aspergillus niger, Aspergillus terreus, Aspergillus flavus, Aspergillus fumigatus, Candida albicans, Saccharomyces cerevisiae. Fusarium chlamydosporum* was very highly active against *Aspergillus terreus* (6.09 ± 0.21). In comparison to the antibiotics used in this study, the plants extracts were far more active against the test bacterial strains. Five-millimeter diameter wells were cut from the agar using a sterile cork-borer, and 25 µl of the samples solutions *Datura stramonium* (Alkaloids), *Anastatica hierochuntica* (Crude), *Cassia angustifolia* (Crude), *Rosmarinus oficinalis* (Crude), *Citrullus colocynthis* (Crude), *Althaea rosea* (Crude), *Coriandrum sativum* (Crude), *Origanum vulgare* (Crude), *Urtica dioica* (Crude), *Foeniculum vulgare* (Crude), *Medicago sativa, Celosia argentea, Apium graveolens, Brassica rapa, Cichorium endivia, Anethum graveolens, Malva sylvestris*, *Malva parviflora, Daucus carota*, *Vitex agnus-castus*, *Citrus sinensis, Ruta graveolens*, *Thymus vulgaris*, *Passiflora caerulea*, *Glycine max, Brassica oleracea, Olea europaea, Borago officinalis, Sambucus nigra, C. morifolium, Equisetum arvense, Portulaca oleracea, Portulaca oleracea, and Malva neglecta* were delivered into the wells. The plates were incubated for 48 h at room temperature. In agar well diffusion method the selected medicinal plants were effective against *Fusarium chlamydosporum* **Table 2**. *Malva sylvestris* was very highly antifungal activity 6.85±0.25 mm.

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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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Detection of Bioactive Compounds of *Raphanus sativus* Using GC-MS and FT-IR Technical Analysis and Determination of its Anti-Bacterial and Anti-Fungal Activity

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ABSTRACT

Raphanus raphanistrum is an edible root vegetable of the Brassicaceae family. The objective of this study were analysis of the secondary metabolite products. Twenty bioactive compounds were identified in the methanolic extract of *Raphanus sativus*. GC-MS analysis of *Raphanus sativus* revealed the existence of the *Raphanus sativus* leaves proved the presence of alkenes, alkanes, and alkyl halides which shows major peaks at 844.82, 937.40, 1012.63, 1022.27, 1066.64, 1143.79, 1217.08, 1234.44, 1361.74, 2330.01, 2341.58, 2358.94, and 2854.65. In the current study, the anti-microbial activity of *Raphanus sativus* methanolic extract was evaluated by determining the zone of inhibition against nine bacteria and eight fungi and yeast. Maximum zone formation was against *Staphylococcus aureus* (6.75±0.25). *Raphanus sativus* was very highly active against *Aspergillus terreus* (6.99±0.26).

Keywords: *FT-IR, GC-MS analysis,* ***Raphanus sativus****, Anti-Bacterial, Anti-Fungal Activity*

INTRODUCTION

Radishes are grown and consumed throughout the world, being mostly eaten raw as a crunchy salad vegetable. Radishes have long been grown as a food crop, but they also have various medicinal actions. The plant is used in the treatment of intestinal parasites, though the part of the plant used is not specified [1-12]. They have numerous varieties, varying in size, flavor, color, and length of time they take to mature. Radishes owe their sharp flavor to the various chemical compounds produced by the plants, including glucosinolate, myrosinase, and isothiocyanate. They are sometimes grown as companion plants and suffer from few pests and diseases. It is crushed and used as a poultice for burns, bruises and smelly feet. Radishes are also an excellent food remedy for stone, gravel and scorbutic conditions [13-27]. The plant contains raphanin, which is antibacterial and antifungal. It inhibits the growth of Staphylococcus\ aureus, E. coli, streptococci, Pneumococci etc.Radish preparations are useful in liver and gall bladder troubles. It is reported that the methonolic extract of leaves of *Raphanus sativus* active against paracetamol induced hepato toxicity. Paracetamol increced the activity of hepatic enzymes like SGOT, SGPT, serum LDH, serum AP [28-46]. An antioxidant is a molecule capable of slowing or preventing the oxidation of other molecules. The aim of this study were analysis of the secondary metabolite products. The aims of our study were analysis of the secondary metabolite products and evaluation of its antibacterial and antifungal activity.

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MATERIAL AND METHOD

Gas chromatography–Mass Spectrum analysis: *Raphanus sativus* 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.

Fourier transform infrared spectrophotometer (FTIR): The powdered sample of *Raphanus sativus* was treated for FTIR spectroscopy (Shimadzu, IR Affinity, Japan). The sample was run at infrared region between 400 nm and 4000 nm[47-50].

Determination of antimicrobial activity of crude bioactive compounds of *Raphanus sativus*: The test pathogens were swabbed in Müller-Hinton agar plates. Sixty μL of plant extract was loaded on the bored wells. Antifungal activity was evaluated by measuring the zone of inhibition against the test microorganisms. Methanol was used as solvent control[51-55]. 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.

Table 1: Major phytochemical compounds identified in methanolic extract of *Raphanus sativus*

S. No.	Phytochemical compound	RT (min)	Molecular Weight	Exact Mass	Pharmacological actions
1.	Urea , N,N'-bis(2-hydroxyethyl)-	3.219	148	148.084792	*New chemical compound*
2.	2,4-Pentadienenitrile	3.379	79	79.042199	*antimicrobial*
3.	Furfural	3.585	96	96.021129	*Anti-inflammatory*
4.	Dimethyl trisulfide	4.306	125	125.9631634	*anti-inflammation*
5.	Propylparaben	4.781	180	180.078644	*Antimicrobial activity*
6.	1,4-Dihydrothujopsene-(l 1)	5.038	206	206.203451	*New chemical compound*
7.	4-(2,5-Dihydro-3-methoxyphenyl) butylamine	5.484	181	181.146665	*anti-ulcer activity*
8.	1-Butene , 4-isothiocyanato-1-(methylthio)-	6.137	159	159.017641	*New chemical compound*
9.	2(3H)-Naphthalenone , 4,4a,5,6,7,8-hexahydro-1-methoxy-	6.211	180	180.115029	*anti-inflammatory*
10.	5-Hydroxymethylfurfural	6.720	126	126.031694	*antiinflammatory properties*
11.	Dodecanoic acid , 3-hydroxy-	7.670	216	216.1725445	*antimicrobial*
12.	3,4-dimethyl-5-phenyloxazolidine	9.370	177	177.115364	*New chemical compound*
13.	1,7-Dioxa-10-thia-4,13-diazacyclopentadeca-5,9,12-trione	9.084	276	276.077993	*New chemical compound*
14.	2,15-Heptadecadiene , 9-(ethoxymethyl)-	11.269	294	294.292265	*Anti-termitic Activity*
15.	1,1'-(4-Methyl-1,3-phenylene) bis[3-(5-benzyl-1,3,4-thiadiazol-2	12.786	556	556.146362	*anti HIV-1 activity*
16.	Dexchlorpheniramine	13.020	274	274.123676	*anti-allergic activity*
17.	Olean-12-ene-3,28-diol,(3β)-	13.261	442	442.38108	*anti-inflammatory*
18.	Propanal , (2,4-dinitrophenyl) hydrazone	14.033	238	238.070205	*New chemical compound*
19.	Glycine , N-[(3α,5β,12α)-3,12-dihydroxy-24-oxocholan-24-yl]-	23.142	449	449.314123	*New chemical compound*
20.	Oleic acid	15.521	282	282.25588	*anti-inflammatory*

RESULTS AND DISCUSSION

Identification of biochemical compounds: Analysis of compounds was carried out in methanolic extract of *Raphanus sativus*, shown in **Table 1.** Chromatogram GC-MS analysis of the methanol extract of *Raphanus sativus* showed the presence of thirty one major peaks and the components corresponding to the peaks were determined as follows. All peaks were determined to be Urea, N,N'-bis(2-hydroxyethyl)-, 2,4-Pentadienenitrile, Furfural, Dimethyl trisulfide, Propylparaben, 1,4-Dihydrothujopsene-(l 1), 4-(2,5-Dihydro-3-methoxyphenyl)butylamine, 1-Butene, 4-isothiocyanato-1-(methylthio)-, 2(3H)-Naphthalenone, 4,4a,5,6,7,8-hexahydro-1-methoxy-, 5-Hydroxymethylfurfural, Dodecanoic acid, 3-hydroxy-, 3,4-dimethyl-5-phenyloxazolidine, 1,7-Dioxa-10-thia-4,13-diazacyclopentadeca-5,9,12-trione, 2,15-Heptadecadiene, 9-(ethoxymethyl)-, 1,1'-(4-Methyl-1,3-phenylene)bis[3-(5-benzyl-1,3,4-thiadiazol-2, Dexchlorpheniramine, Olean-12-ene-3,28-diol,(3β)-, Propanal, (2,4-dinitrophenyl)hydrazine , Dextromethorphan, Oleic acid , Normorphine, Codeine and Glycine, N-[(3α,5β,12α)-3,12-dihydroxy-24-oxocholan-24-yl]. The FTIR analysis of *Raphanus sativus* leaves proved the presence of alkenes, alkanes, and alkyl halides which shows major peaks at 844.82, 937.40, 1012.63, 1022.27, 1066.64, 1143.79, 1217.08, 1234.44, 1361.74, 2330.01, 2341.58, 2358.94, and 2854.65. In the current study, the anti-microbial activity of *Raphanus sativus* methanolic extract was evaluated by determining the zone of inhibition against nine bacteria and eight fungi and yeast. Clinical pathogens were selected for antibacterial activity namely, *Staphylococcus aureus, Streptococcus faecalis, Klebsiella pneumonia, Salmonella typhi, Salmonella typhi, Bacillus subtilis, Escherichia coli, Proteus mirabilis,* and *Streptococcus pyogenes*. Maximum zone formation was against *Staphylococcus aureus* (6.75±0.25). Methanolic extraction of *Raphanus sativus* showed notable antifungal activities against *Penicillium expansum*, *Aspergillus niger*, *Aspergillus terreus*, *Candida albicans*, *Saccharomyces cerevisiae*, *Microsporum canis*, *Trichoderma viride,* and *Trichoderma horzianum. Raphanus sativus* was very highly active against *Aspergillus terreus* (6.99±0.26). In comparison to the antibiotics used in this study, the plants extracts were far more active against the test bacterial strains.

CONCLUSION

Medicinal property of *Raphanus sativus* methanolic extract is due to presence of secondary metabolites. Twenty phytoconstituents were identified by (GC-MS) analysis. This plant derived bioactive compounds used as source of antibiotic properties and pharmaceutical industries used for drug formulation.

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Characterization of Antimicrobial Metabolites Produced by Salvadora persica and Analysis of Its Chemical Compounds Using GC-MS and FTIR

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ABSTRACT

Meswak (*Salvadora persica*) is one of the most commonly used medicinal plants for oral hygiene among global Muslim community. The objectives of this study were analysis of the secondary metabolite products using GC-MS and FTIR and evaluation of antimicrobial activity. The FTIR analysis proved the presence of alkyl halides, alkanes, and alkenes which shows major peaks at 960.55, 1029.99, 1097.50, 1141.86, 1321.24, 1373.32, 1616.35, 1723.65, 2852.72 and 2922.16. Our research recorded maximum zone formation was against *Staphylococcus aureus* (6.635±0.25). *Salvadora persica* was very highly active against *Aspergillus terreus* 6.77±0.24. Twenty one bioactive compounds were identified in the methanolic extract of *Salvadora persica*. GC-MS analysis of *Salvadora persica* revealed the existence of the 5α-Androstan-16-one , cyclic ethylene mercaptole , Glycerin , 3,5-Dithiahexanol 5,5-dioxide , 1H-Pyrazole-1-carbothioamide ,3,5-dimethyl- , 17-Octadecynoic acid , Benzenepropanoic acid , α-(hydroxyimino)- , Indan-1,2-dione , 4-methyl- , Butanoic acid , 4,4'-dithiobis[2-amino-, [S-(R*,R*)]- , 5-Hydroxymethylfurfural , 1H-Pyrrole , 1-(phenylmethyl)- , Cyclopentanone , 2-cyclopentylidene- , Phenol ,2-methoxy-6-(1-propenyl)- , 2,7-Diphenyl-1,6-dioxopyridazino[4,5:2',3']pyrrolo[4',5'-d]pyrida , 2-(4-(But-2-yl)phenyl)propanoic acid , 3H-Cyclodeca[b]furan-2-one , 4,9-dihydroxy-6-methyl-3,10-dim , Phenol ,2,6-dimethoxy-4-(2-propenyl)- , Butylaldehyde ,4-benzyloxy-4-[2,2,-dimethyl-4-dioxolanyl]- , Benadryl , 9-Hexadecenoic acid , i-Propyl 11,12-methylene-octadecanoate and 2,6-Bis[2-[2-S-thiosulfuroethylamino] ethoxy]pyrazine.

Keywords: *GC-MS, FT-IR, Salvadora persica, Pseudomonas aerogenosa, Proteus mirabilis, Staph. aureus, Klebsiella pneumonia*

INTRODUCTION

Salvadora persica has antiurolithiatic properties. Used for centuries as a natural toothbrush, its fibrous branches have been promoted by the World Health Organization for oral hygiene use[1-6]. Research suggests that it contains a number of medically beneficial properties including abrasives, antiseptics, astringent, detergents, enzyme inhibitors, and fluoride. Previous studies have reported that S. persica extracts were effective against *Streptococcus mutans* and *Streptococcus faecalis*, even using low extract concentrations. Plaque is found preferentially at protected and stagnant surfaces, and these are at the greatest risk of disease[7-15]. Moreover, the attachment, growth, removal and reattachment of bacteria to the tooth surface are a continuous and dynamic process. Dental plaque, biofilms of microorganisms on tooth surface, plays an important role in the development of caries and periodontal disease[16-23]. Plaque is found preferentially at protected and stagnant surfaces, and these are at the greatest risk of disease. It was established that mutans group of *Streptococci* are the key agents

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causing dental caries[24-29]. According to studies, mutans *Streptococci* can colonize the tooth surface and initiate plaque formation by their ability to synthesize extracellular polysaccharides from sucrose, using glucosyl transferase. This sucrose dependent adherence and accumulation of cariogenic streptococci is critical to the development of pathogenic plaque[30-33]. Some types of interactions are thought to be of primary importance in the colonization of the periodontal environment. The further accumulation of plaque around the gingival and subgingival region may lead to a shift in its microbial composition from Streptococcus-dominated to a larger number of *Actinomyces* spp., and an increased number of capnophilic and obligatory anaerobic bacteria, such as *Porphyromonas gingivalis*. Several in vitro studies have indicated that *Salvadora persica* contains substances that possess dental plaque inhibiting properties against oral microbes[34-38]. The fresh leaves can be eaten as part of a salad and are used in traditional medicine for cough, asthma, scurvy, rheumatism, piles and other diseases. The flowers are small and fragrant and are used as a stimulant and are mildly purgative[39-42]. The berries are small and barely noticeable; they are eaten both fresh and dried. The aims of our research were analysis of the secondary metabolite products and determination of antibacterial and antifungal activity.

MATERIAL AND METHOD

Gas chromatography–Mass Spectrum and Fourier transform infrared spectrophotometer analysis: *Salvadora persica* 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. Interpretation of mass spectrum was conducted using the database of National Institute of Standards and Technology (NIST, USA). The powdered sample of *Salvadora persica* was treated for FTIR spectroscopy (Shimadzu, IR Affinity 1, Japan)[43,44]. The sample was run at infrared region between 400 nm and 4000 nm. 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.

Antibacterial and antifungal activity of natural compounds of *Salvadora persica*: The test pathogenic bacteria were swabbed in Müller-Hinton. Seventy μL of plant extract was loaded on the bored wells. Antifungal activity was evaluated by measuring the zone of inhibition against the test fungi. 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[45-47].

Table 1: Major phytochemical compounds identified in methanolic extract of *Salvadora persica*

S. No.	Phytochemical compound	RT (min)	Molecular Weight	Exact Mass	Pharmacological actions
1.	5α-Androstan-16-one , cyclic ethylene mercaptole	3.264	350	350.210194	antimicrobial *activity*
2.	Glycerin	3.310	92	92.047344	*anti*-inflammatory
3.	3,5-Dithiahexanol 5,5-dioxide	3.379	170	170.007136	*anti*-tumour *activity*
4.	1H-Pyrazole-1-carbothioamide ,3,5-dimethyl-	3.625	155	155.051719	*anti*-inflammatory
5.	17-Octadecynoic acid	3.768	280	280.24023	*anti*- diarrheal
6.	Benzenepropanoic acid , α-(hydroxyimino)-	4.975	179	179.058243	antimicrobial *activity*
7.	Indan-1,2-dione , 4-methyl-	5.353	160	160.052429	antimicrobial, antitumor, *anti*-inflammatory, antiviral
8.	Butanoic acid , 4,4'-dithiobis[2-amino-, [S-(R*,R*)]-	5.759	268	268.05515	*anti*-inflammatory agents
9.	5-Hydroxymethylfurfural	6.366	126	126.031694	*Anti-inflammatory properties*
10.	1H-Pyrrole , 1-(phenylmethyl)-	7.424	157	157.089149	*anti*-Candida *activities*

11.	Cyclopentanone , 2-cyclopentylidene-	8.002	150	150.1044655	*anti*-inflammatory, analgesic, anticonvulsant
12.	Phenol ,2-methoxy-6-(1-propenyl)-	8.425	164	164.08373	antibacterial
13.	2,7-Diphenyl-1,6-dioxopyridazino[4,5:2',3'] pyrrolo[4',5'-d]pyrida	9.930	355	355.106924	New chemical compound
14.	2-(4-(But-2-yl)phenyl)propanoic acid	10.325	206	206.13068	*anti*-inflammatory agent with analgesic *properties*
15.	3H-Cyclodeca[b]furan-2-one , 4,9-dihydroxy-6-methyl-3,10-dim	10.617	264	264.13616	antioxidant activity
16.	Phenol ,2,6-dimethoxy-4-(2-propenyl)-	11.092	194	194.094295	New chemical compound
17.	Butylaldehyde ,4-benzyloxy-4-[2,2,-dimethyl-4-dioxolanyl]-	12.597	278	278.15181	*anti*-inflammatory
18.	Benadryl	13.123	255	255.162314	antihistamine
19.	9-Hexadecenoic acid	13.507	254	254.22458	*anti*-inflammatory
20.	i-Propyl 11,12-methylene-octadecanoate	13.501	338	338.318481	antibacterial activity
21.	2,6-Bis[2-[2-S-thiosulfuroethylamino] ethoxy] pyrazine	14.222	478	478.032047	*anti*-bacterial activity

RESULTS AND DISCUSSION

Identification of biochemical compounds: Analysis of compounds was carried out in methanolic extract of *Salvadora persica*, shown in **Table 1.** Chromatogram GC-MS analysis of the methanol extract of *Salvadora persica* showed the presence of thirty one major peaks and the components corresponding to the peaks were determined as follows. All peaks were determined to be 5α-Androstan-16-one, cyclic ethylene mercaptole, Glycerin , 3,5-Dithiahexanol 5,5-dioxide, 1H-Pyrazole-1-carbothioamide ,3,5-dimethyl-, 17-Octadecynoic acid, Benzenepropanoic acid , α-(hydroxyimino)- , Indan-1,2-dione, 4-methyl-, Butanoic acid, 4,4'-dithiobis[2-amino-, [S-(R*,R*)]-, 5-Hydroxymethylfurfural, 1H-Pyrrole, 1-(phenylmethyl)-, Cyclopentanone, 2-cyclopentylidene-,Phenol,2-methoxy-6-(1-propenyl)-, 2,7-Diphenyl-1,6-dioxopyridazino[4,5:2',3']pyrrolo[4', 5'-d]pyrida, 2-(4-(But-2-yl)phenyl)propanoic acid, 3H-Cyclodeca[b]furan-2-one, 4,9-dihydroxy-6-methyl-3,10-dim, Phenol, 2,6-dimethoxy-4-(2-propenyl)-, Butylaldehyde, 4-benzyloxy-4-[2,2,-dimethyl-4-dioxolanyl]-, Benadryl, 9-Hexadecenoic acid, i-Propyl 11,12-methylene-octadecanoate and 2,6-Bis[2-[2-S-thiosulfuroethylamino] ethoxy]pyrazine. The FTIR analysis of *Salvadora persica* leaves proved the presence of alkyl halides, alkanes, and alkenes which shows major peaks at 960.55, 1029.99, 1097.50, 1141.86, 1321.24, 1373.32, 1616.35, 1723.65, 2852.72 and 2922.16. In the current study, the anti-microbial activity of *Salvadora persica* methanolic extract was determinate by zone of inhibition against many bacteria, fungi and yeast. Clinical pathogens *Klebsiella pneumonia, Escherichia coli, Staphylococcus aureus, Salmonella typhi, Bacillus subtilis, Streptococcus faecalis, Proteus mirabilis* and *Streptococcus pyogenes* were selected for antibacterial activity. Our research found maximum zone formation was against *Staphylococcus aureus* (6.635 ± 0.25). Antifungal activities against *Aspergillus niger*, *Penicillium expansum*, *Trichoderma horzianum, Aspergillus terreus, Candida albicans*, *Trichoderma viride, Saccharomyces cerevisiae,* and *Microsporum canis*. *Salvadora persica* recorded high antifungal activity against against *Aspergillus terreus* (6.77±0.24). Medicinal properties of *Salvadora persica* extract is due to presence of bioactive metabolites. Twenty one phytoconstituents were identified by Gas chromatography – Mass Spectrum and Fourier transform infrared spectrophotometer. This plant derived bioactive compounds used as source of antibiotic properties and pharmaceutical industries used for drug formulation.

CONCLUSION

Twenty one bioactive chemical compounds were identified by GC-MS and FT-IR analysis. This *Salvadora persica* derived bioactive compounds used as source of antibiotic properties and pharmaceutical industries used for drug formulation.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: In this study, all experimental protocols were approved under the Department of Biology, College of Science for women, University of Babylon, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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Determination of Bioactive Chemical Compounds of *Aspergillus Flavus* Using GC/MS and Ftir and Evaluation of Its Anti-Microbial Activity

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ABSTRACT

The objective of this study was analysis of the secondary metabolite products and evaluation antibacterial activity. Bioactives are chemical compounds often referred to as secondary metabolites. Thirty one bioactive compounds were identified in the methanolic extract of *Aspergillus flavus*. *Origanum vulgare* (Crude) was very highly active 6.95±0.25 mm. The results of anti-fungal and anti-bacterial activity produced by *Aspergillus flavus* showed that the volatile compounds were highly effective to suppress the growth of *Penicillium expansum* 5.33±0.21and *Pseudomonas eurogenosa* (6.72 ± 0.23) mm.

Keywords: *Antifungal, Antibacterial, Aspergillus flavus, GC-MS, Medicinal plants, Metabolites.*

INTRODUCTION

The genus *Aspergillus* belongs to the *Deuteromycota* division of the fungi kingdom. The genus comprises approximately 180 species, of which 33 have been associated with human disease [1-6]. A culture yielding *Aspergillus* spp., in addition to enabling a diagnosis of invasive aspergillosis, may further define therapeutic options via susceptibility testing or the isolation of a species possessing inherent antifungal resistance; examples of the latter include *A terreus* and *A nidulans*, which are both resistant to amphotericin B. Some species of the genus produce secondary metabolites in food as aflatoxins (AFs) which are produced mainly by *Aspergillus flavus* and *Aspergillus parasiticus*[7-19]. *A. flavus* is also an opportunistic pathogen and has been isolated from insects, birds, mammals, and plants and widely distributed soil-borne molds and can be found anywhere on earth. It can reproduce abundantly resulting from the production of numerous airborne conidia[20-27]. The spores can easily disperse by air. Environment has a great impact on mould growth, with humidity being the most important variable. It is a saprophytic fungus that is capable of surviving on many organic nutrient sources like plant debris, tree leaves[28-35], decaying wood, animal fodder, cotton, compost piles, dead insect and animal carcasses, outdoor and indoor air environment (air ventilation system), stored grains, and even human and animal patients[36-39]. The aims of this study were analysis of the secondary metabolites and evaluation antibacterial and antifungal activity.

MATERIAL AND METHOD

Aspergillus flavus was isolated from dried fruit and the pure colonies were selected, 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 eighteen days at 130 rpm. The extraction was performed by adding twenty five ml methanol to 150 ml liquid culture in an Erlenmeyer flask after the filtration of the culture. The residue was dissolved in 1 ml methanol, filtered through a 0.2 μm syringe filter, and stored at 4ºC for 24 h before

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being used for GC-MS[40-43]. The identification of the components was based on comparison of their mass spectra with those of NIST mass spectral library[44-49].

Determination of antibacterial and antifungal activity: Bacterial pathogens were swabbed in Muller Hinton agar plates. 90μl of fungal extracts was loaded on the bored wells. *Aspergillus flavus* isolate was suspended in potato dextrose broth and diluted to approximately 105 colony forming unit (CFU) per ml. Five-millimeter diameter wells were cut from the agar using a sterile cork-borer, and 25 μl of the samples plant 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. Methanol was used as solvent control[50,51]. Amphotericin B and fluconazole were used as reference antifungal agent. Data were analyzed using analysis of variance (ANOVA) and differences among the means were determined for significance at P < 0.05 using Duncan's multiple range test (by SPSS software) Version 9.1.

Table 1: Major bioactive chemical compounds identified in methanolic extract of *Aspergillus flavus*

S. No.	Bioactive compound	RT (min)	Formula	Exact Mass
1.	1,2-cis-1,5-trans-2,5-dihydroxy-4-methyl-1-(1-htdroxy-1-isopropyl)cy	3.585	$C_{10}H_{18}O_3$	186.125594
2.	2-Furancarboxaldehyde,5-methyl	3.613	$C_6H_6O_2$	110.036779
3.	2(5H)-Furanone	3.831	$C_4H_4O_2$	84.021129
4.	6-Hydroxymethyl-5-methyl-bicyclo[3.1.0]hexan-2-one	3.859	$C_8H_{12}O_2$	140.08373
5.	D-Glucose,6-O-α-D-galactopyranosyl	3.997	$C_{12}H_{22}O_{11}$	342.11621
6.	2-(3-Hydroxy-propyl)-cyclohexane-1,3-dione	4.408	$C_9H_{14}O_3$	170.094295
7.	9-Oxa-bicyclo[3.3.1]nonane-1,4-diol	4.466	$C_8H_{14}O_3$	158.094295
8.	Benzenemethanol,2-(2-aminopropoxy)-3-methyl	4.546	$C_{11}H_{17}NO_2$	195.125929
9.	1,2-Cyclopentanedione,3-methyl	4.712	$C_6H_8O_2$	112.052429
10.	α-D-Glucopyranoside, O-α-D-glucopyranosyl-(1.fwdarw.3)-ß-D-fruc	4.820	$C_{18}H_{32}O_{16}$	504.169035
11.	1-Nitro-2-acetamido-1,2-dideoxy-d-mannitol	4.901	$C_8H_{16}N_2O_7$	252.095751
12.	Desulphosinigrin	5.009	$C_{10}H_{17}NO_6S$	279.077658
13.	Orcinol	5.175	$C_7H_8O_2$	124.052429
14.	Bicyclo[2.2.1]heptane-2-carboxylic acid isobutyl-amide	5.284	$C_{12}H_{21}NO$	195.162314
15.	2H-Oxecin-2-one.3.4.7.8.9.10-hexahydro-4-hydroxy-10-methyl-.[4	5.341	$C_{10}H_{16}O_3$	184.109944
16.	2H-Pyran,tetrahydro-2-(12-pentadecynyloxy)	5.536	$C_{20}H_{36}O_2$	308.27153
17.	Maltol	5.616	$C_6H_6O_3$	126.031694
18.	2-Tridecyl-5-(acetylamino)tetrahydro-γ-pyrone	5.782	$C_{20}H_{37}NO_3$	339.277344
19.	Cycloundecanone , oxime	5.890	$C_{11}H_{21}NO$	183.162314
20.	6-Acetyl-ß-d-mannose	6.245	$C_8H_{14}O_7$	222.073953
21.	5-Hydroxymethylfurfural	7.149	$C_6H_6O_3$	126.031694
22.	1-Gala-l-ido-octonic lactone	8.660	$C_8H_{14}O_8$	238.068868
23.	Pterin-6-carboxylic acid	8.820	$C_7H_5N_5O_3$	207.039239
24.	Uric acid	9.701	$C_5H_4N_4O_3$	168.02834
25.	Acetamide , N-methyl -N-[4-[2-acetoxymethyl-1-pyrrolidyl]-2-butynyl]-	14.908	$C_{14}H_{22}N_2O_3$	266.163042
26.	l-(+)-Ascorbic acid 2,6-dihexadecanoate	15.183	$C_{38}H_{68}O_8$	652.49142
27.	D-fructose , diethyl mercaptal , pentaacetate	15.349	$C_{20}H_{32}O_{10}S_2$	496.14369

Contd…

28.	2-Bromotetradecanoic acid	16.694	$C_{14}H_{27}BrO_2$	306.119442
29.	Octadecanal ,2 –bromo	16.860	$C_{18}H_{35}BrO$	346.187128
30.	L-Ascorbic acid , 6-octadecanoate	17.084	$C_{24}H_{42}O_7$	442.293055
31.	18,19-Secoyohimban-19- oic acid,16,17,20,21-tetradehydro-16	17.186	$C_{21}H_{24}N_2O_3$	352.178692

Table 2: Zone of inhibition (mm) of test different bioactive compounds and standard antibiotics of medicinal plants to *Aspergillus flavus*

S. No.	Plant	Zone of inhibition (mm)
1.	*Ricinus communis* (Alkaloids)	3.09 ± 0.19
2.	*Datura stramonium* (Alkaloids)	2.98 ± 0.21
3.	*Linum usitatissimum* (Crude)	5.13 ± 0.23
4.	*Anastatica hierochuntica* (Crude)	6.03 ± 0.22
5.	*Cassia angustifolia* (Crude)	4.90 ± 0.24
6.	*Euphorbia lathyrus* (Crude)	5.99 ± 0.25
7.	*Rosmarinus oficinalis* (Crude)	5.38 ± 0.23
8.	*Citrullus colocynthis* (Crude)	4.76 ± 0.17
9.	*Althaea rosea* (Crude)	6.01 ± 0.20
10.	*Coriandrum sativum* (Crude)	6.51 ± 0.26
11.	*Origanum vulgare* (Crude)	6.95 ± 0.25
12.	*Urtica dioica* (Crude)	3.99 ± 0.21
13.	*Foeniculum vulgare* (Crude)	3.05 ± 0.19
14.	*Ocimum basilicum* (Crude)	4.94 ± 0.23
15.	Control	0.00

RESULTS AND DISCUSSION

Gas chromatography and mass spectroscopy analysis of compounds was carried out in methanolic extract of *A. flavus*, shown in **Table 1.** The First set up peak were determined to be 1,2-cis-1,5-trans-2,5-dihydroxy-4-methyl-1-(1-htdroxy-1-isopropyl)cy. The second peak indicated to be 2-Furancarboxaldehyde,5-methyl. The next peaks considered to be 2(5H)-Furanone, 6-Hydroxymethyl-5-methyl-bicyclo[3.1.0]hexan-2-one, D-Glucose,6-O-α-D-galactopyranosyl, 2-(3-Hydroxy-propyl)-cyclohexane-1,3-dione, 9-Oxa-bicyclo[3.3.1]nonane-1,4-diol, Benzenemethanol,2-(2-aminopropoxy)-3-methyl, 1,2-Cyclopentanedione,3-methyl, α-D-Glucopyranoside, O-α-D-glucopyranosyl-(1.

fwdarw.3)-ß-D-fruc, 1-Nitro-2-acetamido-1,2-dideoxy-d-mannitol, Desulphosinigrin, Orcinol, Bicyclo[2.2.1] heptane-2-carboxylic acid isobutyl-amide, 2H-Oxecin-2-one.3.4.7.8.9.10-hexahydro-4-hydroxy-10-methyl-. [4, 2H-Pyran,tetrahydro-2-(12-pentadecynyloxy), Maltol, 2-Tridecyl-5-(acetylamino)tetrahydro-γ-pyrone, Cycloundecanone, oxime, D-Glucose,6-O-α-D-galactopyranosyl, 6-Acetyl-ß-d-mannose, 5-Hydroxymethylfurfural, 1-Gala-l-ido-octonic lactone, Pterin-6-carboxylic acid, Uric acid, Acetamide, N-methyl -N-[4-[2-acetoxymethyl-1-pyrrolidyl]-2-butynyl], l-(+)-Ascorbic acid 2,6-dihexadecanoate, D-fructose, diethyl mercaptal, pentaacetate, 2-Bromotetradecanoic acid, Octadecanal, 2–bromo, L-Ascorbic acid, 6-octadecanoate, 18,19-Secoyohimban-19-oic acid,16,17,20,21-tetradehydro-16. Clinical pathogens selected for antibacterial activity namely, (*Streptococcus pneumonia*, *Pseudomonas eurogenosa*, *Staphylococcus epidermidis*, *Escherichia coli*, *Proteus mirabilis*, *Streptococcus pyogenes*, *Staphylococcus aureus*, and *Klebsiella pneumonia,* maximum zone formation against *Pseudomonas eurogenosa* (6.72 ± 0.23) mm. Methanolic extraction of *Candida glabratus* showed notable antifungal activities against *Microsporum canis*, *Aspergillus terreus*, *Aspergillus* 5.902*fumigatus*, *Candida albicans*, *Saccharomyces cerevisiae*, *Penicillium expansum* and *Trichoderma viride* with high activity against *Penicillium expansum* 5.33±0.21. In agar well diffusion method the selected medicinal plants (*Ricinus communis* (Alkaloids), *Datura stramonium*(Alkaloids), *Linum usitatissimum* (Crude), *Anastatica hierochuntica* (Crude), *Cassia angustifolia* (Crude), *Euphorbia lathyrus* (Crude), *Rosmarinus oficinalis* (Crude), *Citrullus colocynthis* (Crude), *Althaea rosea* (Crude), *Coriandrum sativum* (Crude), *Origanum vulgare* (Crude), *Urtica dioica* (Crude), *Foeniculum vulgare* (Crude), and *Ocimum basilicum* (Crude), **Table 2**. *Origanum vulgare* (Crude) was very highly active 6.95 ± 0.25 mm against *A. flavus*. *Aspergillus flavus* 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.

CONCLUSION

The results of this study showed that *A. flavus* species produce many important secondary metabolites with high biological activities. The purification of compounds produced by *A. flavus* species can be useful.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: In this research, all experimental protocols were approved under the Department of Biology, College of Science for women, University of Babylon, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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Anti-Fungal, Antitumor and Anti-Inflammatory Activity of *Acorus Calamus*

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ABSTRACT

Acorus calamus is a herb used for the appetite and as an aid to the digestion. It is used for fevers, stomach cramps and cholic. Their rhizomes were used for toothache and powdered rhizome for congestion. The rhizome part is also used to treat several diseases like asthma and bronchitis and as sedative. Native tribes treated cough by making a decoction of the plant as a carminative and also for cholic. It is a main medhya drug, which has the property of improving the memory power and intellect. *Acorus calamus* is used in the conditions of vata and kapha, stomatopathy, hoarseness, flatulence, dyspepsia, helminthiasis, amenorrhea, dysmenorrheal, nephropathy, calculi, stragury. *Acorus calamus* leaves, rhizomes and its essential oil has many biological activities16 like antispasmodic, carminative and also used for treatment of epilepsy, mental ailments, chronic diarrhea, dysentery, bronchial catarrh, intermittent and tumors. It also has the insecticidal, antifungal, antibacterial, tranquilizing, antidiarrhoeal, antidyslipidemic, neuroprotective, antioxidant, anticholinesterase, spasmolytic, vascular modulator activities. The parts used in most of the experimental studies are the leaves, roots and stem of the plant. The dry rhizome contains some of the yellow aromatic oil, calamus oil that are responsible for their medicinal and insecticidal properties. Studies were also done on their rhizome part and in its oils in order to identify the active constituents and its medicinal values.

Keyword: *Acorus calamus, Insecticidal, Anti-fungal, Antitumour, Anti-inflammatory activity, Review.*

INTRODUCTION

Mother earth has bestowed to the mankind and variousnplants with healing ability for curing the ailments of human being. This unique feature has been identified since pre historic times. The WHO has also estimated that 80% of the world population meets their primary health care needs through traditional medicine only [1-9]. Medicinal plants are those plants possessing secondary metabolites and are potential sources of curative drugs with the very long list of chemicals and its curative nature. *Acorus calamus* is a tall perennial wetland monocot plant from the *Acoraceae* family. The scented leaves and rhizomes of sweet flag have been traditionally used as a medicine and the dried and powdered rhizome has a spicy flavour and is used as a substitute for ginger, cinnamon and nutmeg for its odor. It is known by a variety of names, including cinnamon sedge, flag root, gladdon, myrtle flag, myrtle grass, myrtle sedge, sweet cane, sweet myrtle, sweet root, sweet rush and sweet sedge. *A. calamus* is probably indigenous to India and now found across Europe, Southern Russia, Northern Asia Minor, China, Japan, Burma, Sri Lanka, and Northern USA. *Calamus* was valued as a stimulant, bitter herb for the appetite and as an aid to the digestion[10-22]. In North America, the decoction was used for fevers, stomach cramps and colic; the rhizome was chewed for toothache and powdered rhizome was inhaled for congestion[23-29]. In Ayurvedic medicine *Calamus* is an important herb, and is valued as a "rejuvenator" for the brain and nervous system, and as a remedy for digestive disorders.

Parts used: The parts used are leaves, root (rhizome) and stem. In Asia, Sweet flag has been used for at least

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the last 2000 years. The ancient peoples of China used it to lessen swelling and for constipation. In Ayurvedic medicinal practice India, the rhizomes have been used to cure several diseases like fever, asthma and bronchitis, and as a sedative. Native tribes used it to treat a cough, made a decoction as a carminative and as an infusion for cholic. In Western herbal medicine the herb is chiefly employed for digestive problems such as gas, bloating, colic, and poor digestive function[30-38]. Calamus helps distended and uncomfortable stomachs and headaches associated with weak digestion. Small amounts are thought to reduce stomach acidity, while larger doses increase deficient acid production, a good example of how different doses of the same herb can produce different results.

Pharmacological activities: The rhizomes of *A. calamus* reportedly relieve stomach cramps, dysentery and asthma, and are used as: anthelmintics, insecticides, tonics and stimulants. Alcoholic rhizome extracts of *A. calamus* growing in KwaZulu-Natal, South Africa, were previously found to have anthelmintic and antibacterial activity. Different varieties of *A. calamus* exhibit different levels of ß-asarone, with the diploid variety containing none of the compound. Mammalian toxicity and carcinogenicity of asarones has been demonstrated by other researchers, supporting the discouragement of the medicinal use of *A. calamus* by traditional healers[39-45]. In medical research, more attention is paid to the antioxidant properties of medicinal plants to minimize the harmful effects of radicals.

Anti-fungal activity: β-asarone compound fraction obtained from the crude methanolic extract of *Acorus Calamus* rhizomes has been reported to possess the antifungal activity against the yeast strain of *Candida Albicans*, *Cryptococcus Neoformans, Saccharomyces Cerevisae* and also against *Aspergillus Niger.*

Antitumour: It was reported to be a potent antitumour agent against Daltons Ascites Lymphoma in mice by evaluating the tumour growth, toxicity and haematological parameters.

Anti-inflammatory activity: *Acorus calamus* is a traditional remedy for the inflammation problems but their biological function in the human skin cells not well characterized. *Acorus calamus* has been found to inhibit the expression of polyI: C-induced IL-6 and IL-8 which indicates their inhibitory effect on the expression of the

cytokines which were likely to be in association with the suppression of NF-κB activation and phosphorylation of IRF3 that shows the *Acorus calamus L.* may be used as a promising immunomodulatory agent in the inflammatory skin diseases.

Anti-oxidant activity: *Acorus calamus* extract showed a remarkable increased and decreased levels of certain parameters due to the exposure to noise-stress which ultimately proves their antioxidant activity[46-50]. *Acorus calamus* has been found to render the protection against γ-radiation induced oxidative stress.

Antidiabetic activity: *Acorus calamus*, is widely used in the treatment of diabetes in the traditional folk medicine of America and Indonesia. Four fractions obtained from the radix of *Acorus calamus* were used for insulin releasing or alpha-glucosidase inhibitory action[51-53].

Larvicidal property: *A. calamus* carries huge potential as a mosquito larvicidel. This potential could be exploited for the development of safer and effective botanical mosquito larvicidal tool for the management of *Aedes aegypti.*

CONCLUSION

Medicinal property of *Acorus calamus* is due to presence of secondary metabolites. *Acorus calamus*, is widely used in the treatment of diabetes, antitumour agent against Daltons Ascites Lymphoma, and Anti-inflammatory activity.

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Conflict of interest: None to declare.

Ethical Clearance: In our review, all these major pharmacological activity were complete analysis under the biological department of College of Science for Women in Hillah city.

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Study on Effectiveness of Internal and External Training to the Development of Employee in Corporate Sectors and Hospitals

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ABSTRACT

In the present corporate scenario, the investment which is vested in training programs is very high. The corporate organizations and hospitals are intending to expand the skill set of the employee thus it helps in the organizational growth. Initially, the training was given from the organization employees who are experts in that particular field. But in early 2000s, the involvement of external training programs started booming and it is now gaining better prominence in the corporate market. The employees are also getting involved in those sessions. This study will give a brief comparison of both internal and external training programs for the employee growth in corporate business sectors and hospitals with necessary suggestions.

Keywords: *Training, Perception, Intend, Corporate Sectors, Hospitals*

INTRODUCTION

Employee training is essential to both in organizations growth and an individual's success. There are two distinct types of training one i product/services, policies and operations training, most of which is handled by human resource or another internal department. Second one is knowledge and skill-based training that is not organization-specific and focuses on productivity, managerial, performance or some other specialized technical skill[1-3]. During the recruitment and selection process, the right person should be hired to begin with, but even the right person may need training in how your organization does things. Lack of training can result in lost productivity, lost customers and poor relationships between employees and managers[4-6]. There are many lean tools and techniques are available for better process and production training in the market[7-10]. In fact, a study performed by the American society for training and development found that 41% of employees at organizations with poor training planned to leave within the year, but in organizations with excellent training, only 12% planned to leave[11-15]. In-house training tends to be a bit more informal, as you are utilizing staff to deliver information on a product and/or service or teaching a particular skill[16-19]. Even though the learning is business-specific, you need to consider whether your workplace environment has the technology, space and appropriate environment to deliver an effective training

program[20-23]. At first glance, conducting this type of training in-house may seem the most advantageous and economical approach since we are using internal resources to deliver the training and these individuals understand our organization culture and are familiar with our business operations[24-26]. Sending employees out of the office to learn a new technical skill or improve their management ability or performance can help them develop innovative ideas by thinking outside the box. This can help a stagnant manager get outside of his/her comfort zone by offering new approaches to solve problems or complete projects[27-29].

In-House or Outsourced Instructors: Using internal resources to train can be a drain on productivity and slow down time to market. Sourcing external trainers is a great way to augment your training program, provide a new perspective to the material and speed time to efficiency of learning. Hiring external instructors' helps in employee training also removes any bias within your teams of workers, which can sour training programs you provide in-house.

Training Program Development Model: When the training is conducted internally or externally, a model has to be followed for an effeicive implementation of the program. Every organization has its own way of developing the training and internal and external training program development model as shown in Figure 1.
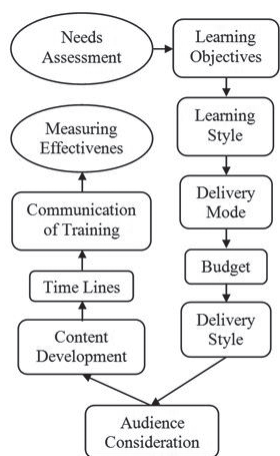
Figure 1: Internal and External Training Program Development Model

COLLECTION AND ANALYSIS

A brief survey was conducted with 150 employees across all levels. Employee intend and organizational intend towards training for different levels percentage from 1980-2017 is given in Table 1. The perception towards the employee's external and internal training is to be bifurcated into three levels which are senior level with 15-25 years' experience, middle level with 5-15 years' experience and entry level 0-5 years' experience.

Table 1: Employee Intend and Organizational Intend towards Training

Employee Preference	1980-1990		1990-2000		2000-2010		2010-2017	
	Org. Ind	Emp. Ind	Org. Ind	Emp. Ind	Org. Ind	Emp. Ind	Org. Ind	Emp. Ind
Senior Level (%)	90	10	80	20	60	40	25	75
Middle Level (%)	100	0	75	25	65	34	60	40
Entry Level (%)	100	0	95	5	85	15	80	20

Senior Employees Perception towards Training: Nine criteria were taken for the assessment of all the levels and in that, if we do the assessment of the senior level for the external and internal training and also the responses are given in Table 2. From the results it was found that the support of accepting the external training programs is very high and they also feel that they get better exposure and also clarity from the programs. The gap analysis will be easily identified and there would not be much biasness as there would not be any favouritism. Results show that the senior employees are not so comfortable with the internal training programs because time availability is very less and internal training monotonous, external programs have the scope of networking and internal it is very less, it becomes more like a meeting than training and becomes a parliament than a session and it helps in gaining third party awareness and current industry standards.

Table 2: Senior Level Perception towards Internal and External Training

Employees Perception towards Internal and External Training	Strongly Agree (%)		Agree (%)		Sometime (%)		Disagree (%)		Strongly Disagree (%)	
	Int.	Ext.	Int.	Ext.	Int.	Ext.	Int.	Ext.	Int.	Ext.
Interesting	15	80	10	10	5	5	15	5	55	0
Improves Confidence	10	75	10	5	5	10	30	5	45	5
Better Clarity	20	65	10	20	5	5	35	10	30	0
Knowledge Updation	10	90	15	5	5	5	40	0	20	0
Networking	20	90	20	0	15	0	25	10	20	0
Different Ideologies	15	80	20	15	10	5	35	0	20	0
Personal Identification	15	60	20	20	10	10	45	5	10	5
Exposure	10	75	10	10	5	5	30	5	45	5
Gap Analysis	10	85	5	5	5	5	30	5	50	0

Middle Level Employees Perception towards Training: The survey was conducted with 150 employees of middle level and their responses are given in Table 3. The reasons for choosing external training are they can networking with people from other industries, they can get a new exposure of what is happening in their industry, they will have 360 degree analysis approach they would be intending to implement those learning in their job and they analysis and creative styles work and perception changes positively. The reasons for choosing internal training are they can get the experience from the immediate seniors, how they need to shape themselves, leaders can become their mentors and guide them, better industry and organization clarity and better goal setting for their professional path.

Table 3: Middle Level Perception towards Internal and External Training

Employees Perception towards Internal and External Training	Strongly Agree (%)		Agree (%)		Sometime (%)		Disagree (%)		Strongly Disagree (%)	
	Int.	Ext.	Int.	Ext.	Int.	Ext.	Int.	Ext.	Int.	Ext.
Interesting	65	80	15	15	15	5	5	0	0	0
Improves Confidence	70	85	15	15	5	0	10	0	0	0
Better Clarity	65	75	10	10	5	5	10	5	10	0
Knowledge Updation	75	90	15	10	5	0	5	0	0	0
Networking	50	75	20	15	15	0	10	10	5	0
Different Ideologies	75	90	20	5	5	5	0	0	0	0
Personal Identification	70	75	20	10	10	5	0	5	0	5
Exposure	50	80	20	10	5	5	15	5	10	0
Gap Analysis	55	90	25	5	10	5	10	0	0	0

Entry Level Employees Perception towards Training: The survey was conducted with 150 junior management employees and junior level perception towards external and internal training with nine different parameters was collected and given in Table 4. The result shows the changes compared to the senior and middle level executives. In this the priority is given more to the internal as compared to the external training as they wish to learn more from the subject matter experts. The maximum external training what they have attended is more on the soft skills training of about 60%. The reasons for not choosing external training for junior management are it is too costly for them, not seen the corporate set-up completely, need to enhance the technical training first and external training is predominantly for the soft skills as technical skills will be done by gamut of trainers in-house. The amount invested in the external programs is very high and it is now a booming business in the present corporate world.

Table 4: Junior Level Perception towards Internal and External Training

Employees Perception towards Internal and External Training	Strongly Agree (%)		Agree (%)		Sometime (%)		Disagree (%)		Strongly Disagree (%)	
	Int.	Ext.	Int.	Ext.	Int.	Ext.	Int.	Ext.	Int.	Ext.
Interesting	75	75	15	25	10	0	0	0	0	0
Improves Confidence	80	80	15	20	5	0	0	0	0	0
Better Clarity	85	60	10	15	5	15	0	10	0	0
Knowledge Updation	90	70	5	10	5	10	0	5	0	5
Networking	75	25	20	25	5	10	0	20	0	20
Different Ideologies	75	25	20	15	5	25	0	15	0	20
Personal Identification	80	30	10	30	10	10	0	10	0	20
Exposure	85	50	15	20	0	5	0	5	0	20
Gap Analysis	80	45	10	25	10	10	0	10	0	10

Growth of External Training organizations: Initially the exposure of the training program was very limited but now the exposure is more. The following Figure 2 shows the average of 10 years attendance percentage of an organization which conceptualized external training in 2008 to 2017.
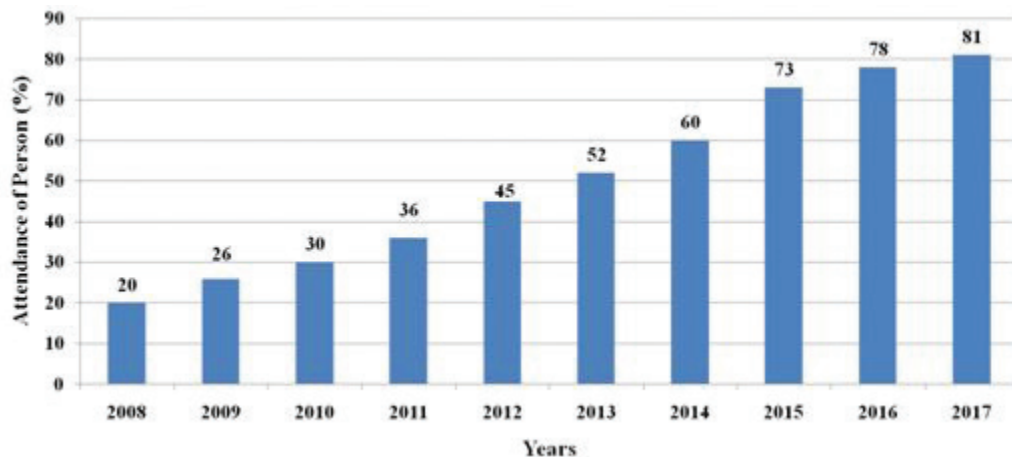
Figure 2: Growth of External Training organizations

As notice that, there is a linear increase in the number of people actively participate in the training. The statistical mean of the attendance in the last ten years can determine through the following formula

Mean = Σ(X1, X2, …XN)/N

The above formula was applied to the data set and it was observed that the average percentage of the attendance of people from several organizations in attending an external training is 50.1%. This intern reflects that there is a linear growth in the number of people getting a positive effect from the trainings conducted. In order to find the Median of the above given fact with the following formula

It can be estimated that the year 2012-2013 can be picked as the right candidate giving the attendance percentage as 47.2%. This year was a very crucial year to confirm the rise in interest of several employees to attend the trainings provide by the external organizations to horn their skills.

Expenditure Spent on Training Organizations: In India, the money spent by several organizations in order to train their employees can be summarized as shown in Figure 3. If we consider the amount of money spent for the past decade and get an average mean out of it, it is 58.22 Million US dollars. This confirms a fact that there is a lot of investment happening in order to flourish the training by external organization. If we apply this methodology, we would obtain a value of 60 million dollars.

$$\text{Median} = \frac{\frac{n}{2} - cf}{f}(W) + L_m$$

$$\text{Mode} = 1 + h\left(\frac{f_m - f_1}{2f_m - f_1 - f_2}\right)$$
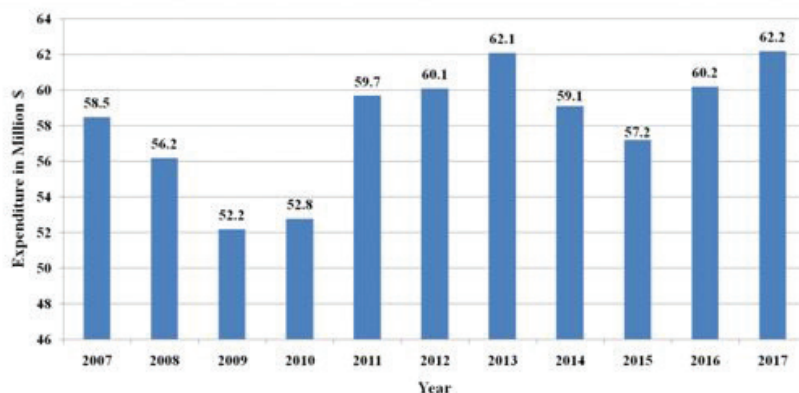
Figure 3: Expenditure Spent on Training Organizations

From the figures, it was identified that the organizations prefer to have external training programs and trainers which helps in different trainers offer different perception and knowledge. The trainers come from the different industry exposure thus they will have wide knowledge.

Suggestions to Improve the Internal Training Programs: If all the following suggestions are carried out in a proper way, the internal training programs will also get the same responses which are received by the external training programs.

- The in-house team should be passionate about the training and development.

- Employees who are in the middle and senior level who are passionate about training should be given a train the trainer program to make them efficient.

- Researching on different styles, orientation and new concepts of training and that has to be incorporated internally.

- The training team should make all the employees to attend minimum six days of training for the particular financial year.

- The list of learning which participants give has to be analysed and assess whether they are implementing it or not.

CONCLUSION

From the above study, it is important to have the external training programs but at the same time, the importance should also be given for the internal training as it would be reducing the cost for the organization and many participants can attend internally in the respective corporate organizations and hospitals. This gives a wide scope for the participants and it will create a better networking for the participants internally. The ratio of the internal and external training program has to be 60/40 hence the participants will have a clear exposure on both external and also internal training programs in every corporate organizations and hospitals.

Ethical Clearance: Taken from the advisory committee ACS Medical College and Hospital, Chennai, India

Source of Funding: Self

Conflict of Interest: Nil

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A Perceptional Analysis on Employee Empowerment in Selected Information Technology Organizations

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ABSTRACT

Objectives: Employee empowerment is a concept seen now days among employees in organizations. Employees seek more programs which help to improve their efficiency and effectiveness in work place. This study contemplates 3 key variables employee empowerment, health and wellness program and organizational commitment. Here organizational commitment the dependent variable is assessed through employee empowerment; health and wellness program the independent variables.

Methods/Statistical Analysis: The research uses regression analysis to find the outcomes of organizational commitment via employee empowerment. The perceptions of the employees were collected through a structured questionnaire.

Findings: The findings reveal that employee empowerment is the important predictor for organizational commitment.

Improvements and Applications: Organizational commitment via employee empowerment; health and wellness program where much national and international literature is not found. This study provides immense benefits to IT industry where the organizations can create various ways which helps the employees empowered and remain more committed towards the organizations.

Keywords: Employee empowerment, health and wellness program, Organizational commitment, Information Technology.

INTRODUCTION

Employee empowerment is a positive element in an organization. Empowering employees along with health and wellness programs develops self-confidence and loyalty which in turn leads the employee to stay fit and pay attention towards their carrier and organizational development. This further enhances the employee to get involved and committed to work for the organization. Empowerment involves giving employees the autonomy to make decisions about how they go about their daily activities[1].

Employee empowerment occurs when an employee tends to share his information, enhances his intellectual capability to gain autonomy while making decision[2] asserted that an organization which focuses on employee empowerment would be able to maintain its survival on the long term.

Empowerment encompasses the showing of power between top management and the lower levels[3].Employee who feels empowered are usually those who perceive and gain power to cope with situation events or individuals using their skills and knowledge[4].Empowerment an effective strategy where by organization uses it to improve the capabilities and responsibilities of its employees, because it is accepted that if an employee is empowered he will be more efficient in performing his tasks[5].

Employee empowerment has widely been recognized as an essential contributor to organizational success with many authors observing a direct relationship between the level of employee empowerment and employee performance[6].When employees perceive that their work is meaningful and important to themselves, they expend more effort on understanding problems from various perspectives, and adopt multiple sources of information to identify solutions [7].This feeling encourages employees to

transcend existing thinking styles, thus, displaying a high level of innovative behavior. In addition, employees who are confident in implementation and have sufficient self-determination to complete their task may expend more effort and continue to solve any problem that may encounter

Baumann[5] included the evaluation of a health and safety interventionmodel. The study demonstrated that training and education provided staff with skills that helpedthem work safer. Furthermore, staff realized they play an integral part in the identification ofhazards and prevention of accidents. Familiarity with their roles and work environment placesemployees in a key position to make recommendations for improvement. Employee control of the work environment is frequently cited in the safety literature and has been found to mediate the relationship between safety climate and workplace injuries[9]. It empowers employees by allowing them to participate in proactive decision making and enact changes–with the encouragement and support of management–that enhance their health, safety and wellness.

Organizations have implemented programs specifically designed to assist employees in their efforts to better balance work and family[2]. These programs are called family-friendly programs and their acceptance is increasing [10]. In U.S. federal agencies, a comprehensive package of family-friendly programs are offered, consisting of flexible work arrangements, dependent care programs, and health-related assistance programs. The rationale for offering these programs can be derived from social exchange theory. Specifically, employees benefiting from family friendly programs will perceive that the organization cares about their overall wellbeing. This assessment will then encourage employees to respond in ways that are important to the organization. Therefore, both the organization and the employee benefit.

The workers are physically present but unable to perform at peak levels due to a health condition. A study of ten common health conditions found that presentism-related costs were greater than direct health costs in most cases, and they accounted for 18–60% of all costs for each of the ten conditions[9]. Workplace programs are also complex, necessitating a tailored and multifaceted approach directed at various stakeholders and settings .New integrated and tailored approaches are urgently needed to curb the increasing prevalence, economic cost and personal burden of presentism.

Organizations invest significant effort and resources to attract, select and retain conscientious, proactive, engaged and committed employees. There is therefore a need for ongoing research directed toward identifying the organizational factors that best promote positive employee attitudes and behavior and positive organizational performance.

A fundamental principle of organizational commitment is that "it has implications for the decision to continue or discontinue membership in the organization" and is considered the type of commitment most relevant to voluntary turnover[12]. Employees with higher levels of organizational commitment will strive to work toward the benefit of the organization and have a desire to remain in their jobs because they have internalized the values of the organization.

As employees feel less loyalty to their organizations (lower organizational commitment), they will begin exhibiting more job search behaviors[10]. Organizational commitment is a push factor, which has been more strongly linked to job search behaviors than pull factors . An employee will evaluate the status of his or her relationship with the organization when deciding whether or not to seek alternative employment and leave one's present job . This assessment would also entail evaluating the nature of one's attachment to the organization. If this attachment has lessened for any number of reasons, then the employee is more likely to engage in job search behaviors.

Similar arguments , who further emphasize that the three components often develop in different ways and have different implications for job behavior. Author define a committed employee as being one who 'stays with an organization, attends work regularly, puts in a full day and more, protects corporate assets, and believes in the organizational goals'.

OBJECTIVES OF THE STUDY

To analyze   the relationship of employee empowerment ,wealth and health programs on organizational commitment.

HYPOTHESIS OF THE STUDY

H1: There is a significant effect of employee empowerment, wealth and health programs on organizational commitment.

Research Methodology: This study was conducted in Information Technology Organizations situated in Chennai. Employees need to be empowered which helps to build more commitment towards organizations.

The data was collected in the month January 2018 for the purpose of the study.

The Sampling Technique of the study is purposive sampling.

Choice of Variables: The National and International literature pertaining to employee empowerment, health and wellness program and organizational commitment among IT employees was collected.

Nature of Variables: The variables have are directly have identical impact on organizational commitment. The employees have given their responses in 5 point Likert scale ranging from Strongly agree to Strongly disagree.

Collection of Data: 150 questionnaires was distributed, out of which 110 questionnaires was received from them.73.3% is the response rate for the study.

DISCUSSION OF THE RESULTS

Table 1: Cronbach alpha

Variables	No. of item	Cronbach alpha
Employee Empowerment	5	0.726
Wellness and Health Programs	5	0.740
Organizational Commitment	5	0.724
Total	15	0.719

The Cronbach alpha for the items are displayed in Table 1.

Table 2: Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1.	.465[a]	.216	.201	2.59473

a. Predictors: (Constant), ORGCOM, WELL

b. Dependent Variable: totep

Table 3: ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	198.483	2	99.242	14.740	.000a
	Residual	720.389	107	6.733		
	Total	918.873	109			

a. Predictors: (Constant), ORGCOM, WELL

b. Dependent Variable: totep

Table 4: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1.	(Constant)	10.568	1.625		6.503	.000
	WELL	.248	.091	.282	2.738	.007
	ORGCOM	.228	.096	.244	2.365	.020

a. Dependent Variable: totep

The R square in the analysis .216 which means that there is 21.6% variation in the dependent organizational commitment which is explained by all independent variables employee empowerment and health and wellness programs. The adjusted R square attempts to yield a more realistic picture of the fit of regression value

to estimate the R square of the sample. The adjusted R is .201. The F value in the ANOVA table 3 proves to significant .000 which is less than the probability value of 0.05. The co-efficient in table 4 employee empowerment and health and well ness program are significant with organizational commitment with significant value which is less than p value of 0.05. It is inferred that employee empowerment and health and well ness program do play a vital role in bringing organizational commitment among employees.

CONCLUSION OF THE STUDY

To make the employees more committed it is important that organizations should take care of their employees. Employees should be empowered which makes them more loyal towards the organization and hence organizations can retain talented employees.

Ethical Clearance: NA

Source of Funding: Self

Conflict of Interest: nil

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Assessment of Major Complication During Pregnancy

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ABSTRACT

Background: the most common causes of maternal mortality are maternal bleeding complication may make the pregnancy at high risk and may affect the fetus or mother or both occur at any times during the pregnancy.

Objective: to assess the major complication during pregnancy and the relationship between demographic variable and obstetrics variable.

Methodology: descriptive study done at Babil maternity teaching hospital conducted, a purposive sample of (180) women how admitted to the ward, from the period 1/11/2017 to 1/1/2018.

Results: the study revealed that the high percentage for women 88.8% with age group (16-35); 60% of the study sample, 83.9% delivered by Cesarean Section; 12.2% by normal vaginal delivery and 3.9% by induction labor, 4.4% of the delivered fetus had fetal anomalies, 18.4% having previous abortion from (1-3) times, 59.4% having delivery within Gestational age (38) weeks and 8.3% of them had (2) still birth.

Also, 37.2% of study sample had blood group B+ and (23.9%) of them they received blood transfusion, (90%) of study sample have anemia (34.4%) of them have urinary tract infection, (25%) they have hypertension, (7.2%) have diabetes and (6.1%) they have pre-eclampsia. There were highly significant association between women age with mode of delivery, fetal anomalies, number of C/S, alive birth, graveda, para, and abortion; also high significant association between Gestational age with UTI and still birth. Also, there were highly significant correlation between demographic, obstetric history and complication.

Conclusion: the most of study sample having previous abortion , anemia, urinary tract infection, hypertension, diabetes and pre-eclampsia.

Recommendation: education the pregnant women about prevention and early detection of complication in prenatal centers.

Keywords: *Assessment, pregnancy, major complication.*

INTRODUCTION

During pregnancy, complication may develop and make the pregnancy at high risk.

Complications such as placenta previa and placental abruption can cause bleeding. Women who have heavy bleeding are at risk of losing the fetus.

Severe complications of pregnancy are present in 1.6% of mothers in the US and in 1.5% of in Canada. In 2013, complications of pregnancy resulted globally in 293,000 deaths. [1] The common causes of maternal mortality are maternal bleeding, maternal sepsis and other infections, hypertensive diseases of pregnancy. Reduced blood flow can slow the growth of fetus and the mother have greater risk of preterm labor and preeclampsia.[2] Gestational diabetes, hormonal changes from pregnancy cause the body to either not make enough insulin, or not used normally causing diabetes.[3]

According to the American College of Obstetricians and Gynecologists (ACOG), 10% of pregnancies end in miscarriage (before 20 weeks of pregnancy). Ectopic pregnancy when the embryo implants outside of the uterus, Preterm labor and delivery, Low birth weight, Birth defects, including blindness, deafness, bone deformities, intellectual disability and Stillbirth.

health conditions that can contribute to stillbirth include chromosomal abnormalities, placental problems, poor fetal growth, chronic health issues of the mother, and infection. Iron-deficiency anemia, pregnant women need more iron than normal for the increased amount of blood they produce during pregnancy. Iron-deficiency anemia is common during pregnancy and is associated with preterm birth and low birth weight.[4]

METHODOLOGY

Design of the study: descriptive analytic design which was structured to assess the Major complication during pregnancy for pregnant women attended maternity and children teaching hospital in hilla city.

Setting of the study: the study has been held at maternity and children teaching hospital.

Sample of the study: Non probable sample (purposive sample) consisted of (180) pregnant women who attended maternity wards.

Instrument construction: questionnaire was designed to collect data.

RESULT

Table 1: Distributions of study sample related demographic data (n = 180)

Demographic data	frequency	%
Age group		
16-35	160	88.8
36& more	20	11.2
Mean 27.3 ± 6.6		
Residence		
Urban	72	40
Rural	108	60
Educational level		
Read& write	10	5.6
Primary school	106	58.9
Secondary school	45	25
College & over	19	10.6
Occupation		
Employed	26	14.4
Not employed	154	85.6

Table (1) shows there were 88.8% with age group (16-35); 60% of the study sample lived at rural area; 58.9% they graduated from primary school and 85.6%of them not employed.

Table 2: distribution of study sample according obstetric history. (n = 180)

Obstetric history	frequency	%
Caesarian section	151	83.9
Normal vaginal delivery	22	12.2
Induction labor	7	3.9
Fetal anomaly		
Yes	8	4.4
No	172	95.6
Alive birth		
0	3	1.7
1-3	141	78.3
4-6&more	36	20
Gravida		
1-3	144	80
4-6& over	36	20
Para		
0	3	1.7
1-3	141	78.3
4-6&more	36	20
Previous abortion		
0	143	79.3
1-3	33	18.4
4& more	4	2.3
Gestational age/weeks		
Less than37	11	6.2
38	107	59.4
39	10	5.6
40& more	52	28.8
Still birth		
0	156	86.7
1-2	15	8.3
2-3	9	5

Table (2) revealed according mode of delivery 83.9% delivered by Cesarean Section; 12.2% by normal vaginal delivery and 3.9% by induction labor;28.5% ,26.5% they had 2,3,delivries respectively; 4.4% of the delivered fetus had fetal anomalies;78.9% of a live birth with in group (1-3);80% of them graved from(1-

3)times;78.3% having from (1-3) children;18.4% having previous abortion from(1-3)times; 59.4% having delivery within Gestational age(38)weeks and 8.3% of them had (2)still birth.

Table 3: distributions of study sample according blood group. (n = 180)

Blood group	frequency	%
A+	40	22.2
B+	67	37.2
AB+	15	8.3
O+	44	24.4
A-	9	5
B-	2	1.1
O-	3	1.7
Received blood		
Yes	43	23.9
No	137	76.1

Table (3) showed that 37.2% of study sample had blood group B+ and (23.9) of them they received blood transfusion

Table 4: distribution of study sample according complication. (n = 180)

Disease	frequency	%
Anemia		
Yes	162	90
No	18	10
UTI		
Yes	62	34.4
No	118	65.6
Major complication		
0	94	52.2
hypertension	45	25
Diabetes	13	7.2
Pre eclampsia	11	6.1
eclampsia	3	1.7
Placenta preavia	11	6.1
Abruption placenta	1	0.6
Asthma	2	1.1

Table (4) revealed (90%) of study sample have anemia (34.4%) of them have urinary tract infection; about the Major complications during pregnancy were

(25%) of them have hypertension ;(7.2%) have diabetes and (6.1%) they have pre-eclampsia.

Table 5: the association (Chi-square test) of women age and gestational age with some variables

Items	value	df	Sig.
Age& mode of delivery	3.130	1	0.077
Age& fetal anomaly	4.800	1	0.028
Age &number of C/S	31.919	1	0.000
Age &alive birth	33.581	1	0.000
Age & gravida	41.312	1	0.000
Age& para	34.069	1	0.000
Age& abortion	8.422	1	0.004
Gestational age& UTI	9.091	1	0.003
Gestational age& still birth	12.677	1	0.000

*Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

Table (5) shows the high significant association between women age with mode of delivery, fetal anomalies, number of C/S, alive birth, graveda, para, and abortion; also high significant association between Gestational age with UTI and still birth.

Table 6: the Person correlation between study samples demographic, obstetric history and complication. n = 180

Items	Pearson Correlation	Sig. (2-tailed)
Age& fetal anomaly	-.164*	.028
Age &number of C/S	.422**	.000
Age & gravida	.480**	.000
Age& para	.436**	.000
Age& abortion	.217**	.000
Mode of delivery& No. of C/S	.504**	.000
Mode of delivery& gestational age	.326**	.000
Mode of delivery& received blood	-.187*	.012
Number of C/S& age	.422**	.000
Number of C/S& fetal anomaly	-.201**	.007

Contd…

Number of C/S& alive birth	.411**	.000
Number of C/S& gravida	.382**	.000
Number of C/S& para	.409**	.000
Number of C/S& Gestational age	-.443**	.000
Abortion & medical disease	.175*	.019
Abortion & Alive birth	.211**	.005
Anemia & UTI	-.265**	.000
Anemia & received blood	.188*	.012
Medical disease& fetal anomaly	-.153*	.040
Medical disease& abortion	.175*	.019
Medical disease& UTI	-.243**	.001

*Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

Table (6) shows the highly significant correlation between women age with, fetal anomalies, number of C/S, graveda, para, and abortion; also Mode of delivery with number of C/S, gestational age and received blood. Number of C/S with age, fetal anomaly, alive birth. Anemia with UTI and received blood. Medical disease with fetal anomaly, abortion and UTI.

DISCUSSION

Demographic Data: The table (1) shows there were 88.8% with age group (16-35); 60% of the study sample lived at rural area; 58.9% they graduated from primary school and 85.6%of them not employed. That result agree with (Patricia ,et al, 2015) they stated that pregnant women who were ≥35 years old had greater odds for hypertension, superimposed preeclampsia, severe preeclampsia, and decreased risk for chorioamnionitis. Older women (≥40 years old) had increased for preeclampsia, fetal distress, and poor fetal growth.

(Martínez HT,et al, 2015) they stated that occupation and education level had influence on the emotionality of adolescents in relation to pregnancy and labor.[5]

A study mentioned that hypertensive disorders of pregnancy. Venous thromboembolism, stillbirth, caesarean delivery and macrosomia. Also, obesity had significant association with an increased rate of hypertensive disorders of pregnancy, cesarean delivery, and macrosomia.[6]

History of miscarriage was elevated (27.2%), and was significant (58.3%, p < 0.01). Caesarean delivery was also elevated (19.5%) (p < 0.01). The major pregnancy complications associated with gestational diabetes and spontaneous preterm delivery (12.6% and 9.1%, respectively).[7]

51% were aware that obesity increases the risk of stillbirth. Maternal weight, educational level and daily exercise were regularly associated with extensive knowledge of maternal risks.[8]

Go to: Illiteracy and less mean age at the time of marriage were observed in both urban and rural regions. Additional numbers of abortions (19.2%) were noted in urban study participants linked to rural region.[9]

According Obstetric History: Table (2) revealed according mode of delivery 83.9% delivered by Cesarean Section; 12.2% by normal vaginal delivery and 3.9% by induction labor;28.5% ,26.5% they had 2,3,delivries respectively; 4.4% of the delivered fetus had fetal anomalies;78.9% of a live birth with in group (1-3);80% of them graved from(1-3) times;78.3% having from (1-3) children;18.4% having previous abortion from(1-3) times; 59.4% having delivery within Gestational age(38) weeks and 8.3% of them had (2) still birth.

Impact of caesarean section on mode of delivery, pregnancy-induced and pregnancy-associated disorders, and complications in the subsequent pregnancy in Germany

Impact of caesarean section on mode of delivery, pregnancy-induced and pregnancy-associated disorders, and complications in the subsequent pregnancy in Germany

Go to: (Jacob L. et al.) Revealed that the complication risks of placenta accreta, increase with a rising number of CS deliveries and the delivery by CS had significant risk for type 1 diabetes, obesity and asthma.[10]

Go to: (0.33%) perinatal death attributable to congenital malformation (0.33%) and (37.4%) cases an intra-uterine death was diagnosed before delivery of the fetus.[11]

Table (3) distributions of study sample according blood group.(n = 180)

Rh incompatibility cause problems if are Rh negative and fetus is Rh positive. The problems usually do not occur in a first pregnancy, but can occur in a later pregnancy.

a small amount of blood from the fetus can cross the *placenta* into the woman's circulation happened during pregnancy or labor and delivery.

Complications occur when Rh antibodies from an Rh-sensitized woman cross the placenta and attack the blood of an Rh-positive fetus. The Rh antibodies destroy some fetal red blood cells, called *hemolytic anemia*.

Deprived of enough red blood cells so the fetus cannot get enough oxygen. it leads to severe fatal illness.[12]

Table (4) distribution of study sample according complication: A study stated that the mean age of the pregnant women were 27.9 ± 5.5 and 26.9 ± 5.7 years in urban and rural areas respectively. The most complication was bleeding before labor, (urban, 47.4%; rural, 62.6%).[13]

Globally Nigeria has the second largest load of maternal death. The major causes of maternal death were hemorrhage (23%), infection (17%), toxemia and eclampsia (11%), unsafe abortion (11%), obstructed labor (11%), malaria (11%), and anemia (11%).[15]

A study revealed that Go to: Iron deficiency anemia is extremely common, particularly in the developing world, reaching a state of global epidemic. Iron deficiency during pregnancy is one of the leading causes of anemia in infants and young children. Many women go through the entire pregnancy without attaining the minimum required intake of iron. This review aims to determine the impact of maternal iron deficiency and iron deficiency anemia on infants and young children. Extensive literature review revealed that iron deficiency is a global nutritional problem affecting up to 52% of pregnant women. Many of these women are symptomatic. Lack of proper weight gain during pregnancy is an important predictor of iron deficiency.

Anemia was vary related to many factors as age and ethnicity. The level below 12 g/dL for females was abnormal. Iron deficiency be symptomatic usually develops slowly over time. More than 50% of pregnant women had insufficient iron intake. More than 52% of pregnant women in the developing world have anemia and complication of prematurity.[16]

Urinary tract infections in pregnant women caused a clinical problem and higher risk more than (40%) of pyelonephritis, and risk of pre-eclampsia, premature birth and low neonatal birth weight. The study predictor of pyelonephritis after 20 weeks' gestation (OR = 5.3, 95% CI: 2.6–11.0) and the risk factors for Urinary tract infections during pregnancy were lower socioeconomic status, sexual activity, older age, multiparity, anatomical urinary tract abnormalities, sickle cell disease and diabetes.[16]

RECOMMENDATION

1. Enhancement care in antennal centers for prevention and early detection of complication before and during pregnancy.

2. Implement anemia prevention and management's protocol.

Conflicts of Interest: there were no conflicts.

Ethical Consideration: Informed consent was obtained and oral permission for agreement to participate in the interviewing face to face from all individual participants included in the study.

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Facts about Premenstrual Cycle Syndrome

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ABSTRACT

Introduction: Premenstrual syndrome (PMS) is a condition that affects a woman's emotions, physical health and behavior. The symptoms affect up to 85% of menstruating women. It impact of life style. The cause of PMS is unknown but it believe that it's related to a change in both sex hormone and serotonin levels before and during menstrual cycle; Levels of estrogen and progesterone when increased can cause mood swings, anxiety, and irritability. Ovarian steroids also modify activity in brain and Serotonin is affects moods, emotions, and thoughts.

Objective: This study aimed to know facts about PMS for women in hilla city.

Method: a descriptive study conducted among menstruating women aged from (15-24) years in hilla city from 1/12/2017- 20/1/2018. Women were agreed in participate face to face in the interview, through using constricting modification according norms and habit of Iraqi women a questioner format which is designed according to the diagnostic measures planned by the American College of Obstetricians and Gynecologists.

Results: The study revealed that 70% of study at age group (15-19) years ; 61% their age of menarche between (12-13) years; 73% had anemia, 44% have irregular menses;70% have moderate bleeding; 45% they have pain perceived before menses and 48% have pain perceived during menses also,70% of them wear elastic under-wear. 24%, 16%, use medication as Brofen and Bonstan, respectively and the most common symptoms of premenstrual syndrome (91%) have abdominal pain, (86%) have mood swings, (85%) back pain and (64%) have leg pain. Also (89%) have equal or more than five symptoms from list A& B (they have premenstrual syndrome).

Conclusions: PMS is a common menstrual disorder, they have pain perceived before and during menses using medication, wear elastic under-wear, the most common symptoms was abdominal pain, mood swings, back and leg pain.

Keywords: *premenstrual symptoms, medication, syndrome*

INTRODUCTION

Premenstrual syndrome (PMS) is a recurrent of somatic and disturbing symptoms occurring in the day's prior menses and impact women's work and lifestyle. "PMS defined by (ACOG) as a clinical state described by the cyclic presence of physical and emotional symptoms not linked to any organic disease that seem during the 5 days before menses in each of the three prior menstrual cycles and fade within 4 days of the onset of menses, without return until at least cycle day 13.

In a Swiss Study the prevalence of PMS among adolescents varies from 10% to 53% of the participants suffered from PMS. In a Japanese study, prevalence rates of moderate to severe PMS were 53%. In a previous US population-based study, prevalence rates of PMS were 8%. Women have a lower quality of life, increased absence from work, reduced work productivity, diminished relationships with others.[1]

Premenstrual syndrome (PMS) affect up to 85% of menstruating women. Related to alteration in both sex hormone and serotonin levels at the before and during menstrual cycle; Levels of estrogen and progesterone when increased can cause mood swings, anxiety, and irritability. Ovarian steroids alter activity in brain associated with premenstrual symptoms and Serotonin affects moods, emotions, and thoughts.[2]

METHODOLOGY

The study was conducted from 1/12/2017-20/1/2018, with agreement from each participant and from the parents if was under 18 years, by written permission agreement. A purposive sample collected from high school students, institute and college (15th to 24 years) in Hilla city. The target sample size was estimated to be 100 participants.

Diagnosis of PMS in this study was made according to the diagnostic criteria proposed by the American College of Obstetricians and Gynecologists (ACOG).[3]

RESULT

Table 1: distribution of study sample according demographic data. (n = 100)

Age/years	F	%
15-19	70	70
20-24	30	30
Mean 18.42 ± 1.712		
Age of menarche		
9-11	10	10
12-14	61	61
15-17	15	15
Total	100	100
Mean 12.87 ± 1.425		
Body Mass Index		
Underweight <18.50	13	13
Normal range 18.50-24.99	66	66
Over weight ≥ 25	18	18
obese ≥ 30	3	3
Mean 22.53±3.95		
Hb	F.	%
Normal 12-16 mg/dL	27	27
Abnormal 8-11.5 mg/dL	73	73

Table(1) revealed that (70%) of study sample at age group (15-19)years,(61%)of them their age of menarche at (12-14) years and 26% at age 13 years ,(21%) were overweight and obese and (73%) they have low level hemoglobin range from(8-11.5) mg/dL.

Table 2: Characteristic of menstrual cycle of participants. (n = 100)

Menstrual regularity	F	%
Yes	56	56
No	44	44
Total	100	100

Contd…

Duration of menstrual cycle		
3	5	
4	17	
5	42	
6	14	
7	22	
Bleeding Severity of menstrual cycle		
Slight	24	24
Moderate	70	70
Severe	6	6
Mean 1.820 ± .519		
Ch-square	**df**	**Sig.**
65.36	2	.000
Pain perceived before menstrual cycle		
Slight	33	33
Moderate	45	45
Severe	22	22
Mean 1.89 ± .747		
Ch-square	**df**	**Sig.**
29.120	2	.000
Pain perceived during menstrual cycle		
Slight	44	44
Moderate	48	48
Severe	8	8
Mean 1.640 ± .627		
Ch-square	df.	Sig.
7.940	2	.019

**Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table (2) shows(44%) of study sample have irregular menstrual cycle, (42%) of them the duration of menses was 5 day and 22% their duration 7 days, (70%) have moderate bleeding, (45%) they perceived moderate pain before period, 22% they perceived severe pain before period and (48%) they perceived moderate pain during period.

Table 3: distribution of personal hygiene practice during menstrual cycle. (n =100)

Changing dipper per day	F.	%
Twice	59	59
fourth	38	38
More than four	3	3

Contd…

Washing genital area with perfumed soup:		
Yes	59	59
No	41	41
Bathing during menstrual cycle:		
Yes.	64	64
No.	36	36
Underwear materials:		
cotton	70	70
fiber	30	30

Table(3) revealed that (59%) of participants changing dipper twice a day and using perfumed soup respectively,(64%) of them bathing during period and (70%) wearing elastic material underwear

Go to:

Table 4: medication management used during menstrual cycle. (n = 100)

Items	Yes	%
Medication taken before menstrual cycle	24	24
Medication taken during menstrual cycle	64	64
Name of medication which taken		
Don't taking	36	36
Brofen	16	16
Bonstan	24	24
Biscobane	1	1
Voltarin	7	7
Parastemol	16	16

Contd…

Frequency of taking medication		
Don't taking	36	36
Once	14	14
Twice	27	27
Third	10	10
As needed	13	13
Total	100	100

Table(4) shows that (24%) they taking medication before period,(64%) they taking medication during period,(24%) of them take Bonstan,(16%) of them taking Brofen and Prastemol, respectively ,and (27%) of them take medication twice a day and (10%) of them take medication three times a day.

Table 5: Symptoms of premenstrual syndrome which occurred from 2 to 14 days before the start of women's menstrual period. (n = 100)

Symptoms	Yes	%	No.	%
nausea and vomiting	45	45	55	55
Breast congestion	53	53	47	47
Abdominal pain	91	91	9	9
Mood swings	86	86	14	14
Anxiety and stress	72	72	28	28
Headache	53	53	47	47
Back pain	85	85	15	15
Leg pain	64	64	36	36
feel tremble	44	44	56	56
Arithmetic mean	66	66	34	34

Table (5) shows that the most common symptoms of premenstrual syndrome (91%) they have abdominal pain, (86%) have mood swings,(85%) back pain and (64%) have leg pain. Also (66%) of study sample they have premenstrual syndrome.

Table 6: assessment of premenstrual cycle (symptoms during the week before)

Symptoms	Yes.	%	No.	%
I feel more depressed and down in my mood	55	55	45	45
I feel anxious, tense	65	65	35	35
I feel hypersensitive to reject or criticism.	29	29	70	70
I feel much more irritable or get anger easily	61	61	39	39
Arithmetic mean	53	53	47	47
I am much less interested than usual in my daily activities	47	47	53	53
I find it much harder to concentrate on thing	60	60	40	40
I feel much more tired and low in energy	81	81	19	19
I have a tendency to crave carbohydrates	39	39	61	61

Contd…

I find myself oversleeping	59	59	41	41
I feel out of control	24	24	76	76
I bothered from breast tenderness or swelling	41	41	59	59
Increased headache	43	43	57	57
Joint or muscle pain	66	66	34	34
Feeling bloated	45	45	54	54
Weight gain	31	31	69	69
Arithmetic mean	49	49	51	51
The number of symptoms from assessment A + The number of symptoms from assessment B				
5 or more	89			
Less than 5	11			

Table (6) revealed that (53%) they suffer from symptoms through the assessment of list A, (49%) they suffer from symptoms through the assessment of list B. also (89%) they have equal or more than five symptoms from list A& B(they have premenstrual syndrome).

DISCUSSION

Table(1) revealed that (70%) of sample at age group (15-19)years, (61%) their age of menarche at (12-14) years and 26% at age 13 years, (21%) were overweight and obese and (73%) they have low level hemoglobin range from (8-11.5) mg/dL. Agree with a study mentioned that the ages at menarche ranged from 11to 13 was (33%), 13 to 14 was (35%). The mean menarche age was 13.5 ± 1.28. [5] And agree with the study stated that the mean age of the students was 20 (range 17-22) years. The average age of menarche was 13.2 years, (9 to 15 years).[6]

Women with a low BMI less than 18.5 were with statistical significance effect of a low BMI women with PMS were more likely than those without PMS to report a stressful symptoms in the past year (OR = 2.3, $p < 0.001$).[4]

Table (2) shows (44%) of study sample have irregular menstrual cycle,(42%) of them the duration of menses was 5 day and 22% their duration 7 days,(70%) have moderate bleeding, (45%) they perceived moderate pain before period, 22% they perceived severe pain before period and (48%) they perceived moderate pain during period.

Agree with a study stated that the duration of menstrual cycle was 3 to 4 days. Fifty percent had menses lasting 3–5days.[5]

The majority (90.4%) were suffered from dysmenorrhea, had a regular menstruation. which significantly higher in obesity with menstrual bleeding duration 7 days who had a positive family history of dysmenorrhea.[6]

Table(3) revealed that (59%) of participants changing dipper twice a day and using perfumed soup respectively,(64%) of them bathing during period and (70%) wearing elastic material underwear

Go to: Women who used recyclable absorbent pads were more likely to have symptoms of urogenital infection (AdjOR=2.3, 95%CI1.5-3.4) than women using disposable pads. There were significant associations between urinary tract infection disease and washing, drying, and storage methods used.[7]

Change sanitary napkin every 4-6 hours, and wash vagina properly and regularly is essential for vaginal hygiene, because the organisms stick to body after removed sanitary napkin.

Table(4) shows that (24%) they taking medication before period, (64%) they taking medication during period, (24%) of them take Bonstan, (16%) of them taking Brofen and Prastemol, respectively and (27%) of them take medication twice a day and (10%) of them take medication three times a day.

Study mentioned that, Headache (4%) and breast complaints (4%) were the most common symptoms and the side effects of medication were used the Non-hormonal options are limited to tranexamic or mefenamic acid.[7]

the levonorgestrel-releasing intrauterine system, combined hormonal contraceptives, tranexamic acid,

and long-course oral progestogens (≥3 weeks per cycle). The reduction in menstrual blood loss achieved with nonsteroidal anti-inflammatory drugs and short-course oral progestogens (≤14 days per cycle) is less remarkable but may be enough for women who have slightly increased blood loss.[7] & [8]

Some women taking an over-the-counter pain reliever before their period start to decrease the amount of pain and bleeding. Antidepressants can help relieve emotional symptoms of PMS for some women. Selective serotonin is the antidepressant used to treat PMS. Diuretics may reduce symptoms of bloating and breast tenderness. Anti-anxiety medicine may help decrease feelings of anxiousness, anti-anxiety drug that acts as a mild tranquilizer, relieves anxiety by increasing serotonin in the brain and decreasing dopamine.[9]

(46.4%) of the participants in the PMS group stated that they self-administered treatment. The most common drug was analgesic (38.4%) and frivolous activities (26.3%). The participants also consulted their friends (33.9%) and their parents (22.8%) when suffering their symptoms. Only 3% of them search for medical consultation.

Table (6) revealed that (53%) they suffer from symptoms through the assessment of list A, (49%) they suffer from symptoms through the assessment of list B. also (89%) they have equal or more than five symptoms from list A& B(they have premenstrual syndrome).

Most women, over 90%, they have some premenstrual symptoms, as bloating, headaches, and moodiness. These symptoms may be so severe that they miss work or school, but other women are not bothered by minor symptoms.[10]

A study stated PMS symptoms usually occur 5-7 days before a woman's menstrual period. There are nearly 150 identified symptoms of PMS. The most common symptoms are mood swings, breast soreness, bloating, acne, cravings for certain foods, increased hunger and thirst, fatigue, constipation or diarrhea, irritability, and feeling depressed.[11]

Agree with study showed that 4.1% of women qualified for severe PMS (six symptoms) and 8.1% practiced for moderate PMS (one to five symptoms), resulting in women of 12.2% who described cyclic symptoms that significantly bothered their life style.[4]

The prevalence of dysmenorrhea was 53.99% while PMS was 48%. (36.6%) females having backache and abdominal pain, (8.9%) having nausea, (25.5%) having anxiety and depression, (12.2%) having breast tenderness, (12.4%) having headache, (2.8%) having vomiting[5]

That study agree with our study mentioned that (85.8%) having at least one of the 10 symptoms of PMS. The three most common somatic symptoms were breast tenderness (74.4%), headache (70.9%), and abdominal bloating (46.5%). The three most common emotional symptoms were angry outbursts (97.7%), anxiety (73.3%), and irritability (68.6%). In most cases, these symptoms were valued as mild to moderate in severity.[5]

CONCLUSION

PMS is a common menstrual disorder among women, having pain perceived before and during menses using medication as Brofen and Bonstan, most of them wear elastic under-wear, the most common symptoms of premenstrual syndrome was abdominal pain, mood swings, back pain and have leg pain.

Recommendation: the study recommended to educated female at age of menarche about menstrual cycle symptoms and self-management.

Ethical Clearance: Informed consent was obtained and oral permission for agreement to participate in the interviewing face to face from all individual participants included in the study.

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Sustainability of Hygiene Behaviours in Nirmal Gram Puraskar Awarded Gram Panchayats in Rajasthan: A Big Challenge

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ABSTRACT

A research was undertaken to assess the extent to which the key hygiene behaviours were sustained in Nirmal Gram Panchayats in Rajasthan. The district wise scores for each of the five key hygiene behaviours in terms of percentage households practising each hygiene behaviour were assessed utilizing household survey questionnaire, structured-observations, spot-checks and interviews with the family members. The results of the research reveal that none of the five key hygiene behaviours was practised by all the households in any of the Nirmal Gram Panchayats in Rajasthan. The percentage households practising the proper storage and handling of water is the lowest at 22.70% and percentage of households using toilet, and washing hands with soap/ash at critical times is the highest at 68.70% each. The percentages of households practising proper collection and disposal of solid waste, and proper disposal of liquid waste are 56.10% and 55.40% respectively. In order to ensure the sustainability of key hygiene behaviours in Nirmal Gram Panchayats in Rajasthan the State Water and Sanitation Mission needs to develop an appropriate, evidence-based, cost-effective behaviour change communication strategy and provide adequate funds, technical support and trained sanitation motivators to all Nirmal Gram Panchayats for its effective implementation, monitoring and continuous follow-up.

Keywords: *Hygiene behaviours, Nirmal Gram Puraskar, Diarrheal diseases, Swachh Bharat Mission, open defecation free, solid waste disposal*

INTRODUCTION

Primary Health care includes safe and adequate water supply, sanitary means of excreta disposal and basic hygiene. These are fundamental determinants of public health. The heavy burden of disease experienced in many developing countries due to illness related to water, sanitation and hygiene is largely attributable to deficiencies in basic services and behaviours [1]. Washing hands with soap can reduce the risk of diarrheal diseases by 43%, water quality improvements can reduce diarrheal risk by 17% and excreta disposal can reduce diarrheal risk by 36% [2]. There is also a link between poor sanitation and acute respiratory infections such as pneumonia. But better hygiene practices-washing hands with soap after defecation and before eating-could halve the infection rate [3]. Well sustained and used water supplies and sanitation facilities mean that for a period that covers the design life of technologies used to provide services, each

member of households in the project area has regular and dependable delivery of water-acceptable in terms of quality and quantity, practices safe disposal of waste 365 days per year [4]. Government of India (GOI) has been promoting sanitation coverage in campaign mode to ensure better health and quality of life for people in rural India. To add vigour to its implementation GOI launched an award based incentive scheme for fully sanitized and open defecation free (ODF) Gram Panchayats (GPs), Blocks, districts and states called "Nirmal Gram Puraskar" (NGP) in October 2003 and gave away the first awards in 2005 as a component of flagship scheme total sanitation campaign [5]. NGP awards were given till the year 2013. NGP seeks to recognise the efforts made by Panchayati Raj Institutions (PRIs) and organizations which have contributed significantly towards full sanitation coverage in their areas of operation. ODF is termination of faecal-oral transmission defined by (a) no faeces found in the environment/village; and (b) every

household as well as public/community institutions using safe technology for disposal of faeces [6] .The NGP implicitly recognized that the nature of behaviour change required for the benefits of sanitation to be realized was collective and not merely increased toilet coverage at household level [7]. In India by 2013, 28590 GPs were awarded NGPs out of which 326 GPs in 28 districts were from Rajasthan [8] .The NGP awarded G Ps are called Nirmal Grams Panchayats. Rajasthan, the largest state by area in India is situated in north-west of the country, comprises 33 districts with 248 blocks and 9177 GPs. The Goals for sanitation in rural Rajasthan set forth by the Government of Rajasthan (GOR) are; (i) creation of open defecation free state (ii) adoption of improved hygiene behaviours by all households and (iii) environmentally safe disposal of solid and liquid waste to be achieved by 2022 [9]. Hygiene refers to conditions and practices that help maintain health and prevent spread of diseases [10].In India "lack of awareness and established age old practice" stand out as predominant reasons for open defecation in case of households where toilet facilities are already available [11].The GOI launched a new programme-Swachh Bharat Mission(Clean India Mission) on 2nd Oct 2014 to accelerate efforts to achieve universal sanitation coverage, improve cleanliness and eliminate open defecation in India by 2019 [12].The focus of Swachh Bharat Mission is on behaviour change intervention including interpersonal communication and creation of complete open defecation free villages rather than only construction of individual toilets [13]. The benefits associated with improved hygiene are well established but it was not included in the Millennium Development Goals [14]. Sustainable Development Goal 6 aims to "Ensure availability and sustainable management of water and sanitation for all" by 2030 and places new emphasis on countries to improve quality and availability of drinking water and ensure safe management of faecal waste [15].The objective 6.2 under sustainable development goal 6 aims to achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations [16]. A study carried out by a consulting agency TARU Leading Edge Private Ltd. in August 2008 on impact assessment of Nirmal GPs reveals that only 6 GPs out of 162 Nirmal GPs in six states (4 percent) seems to have maintained the ODF status, 55 percent households wash hands with soap after defecation,22% wash hands with soap before eating,45% wash hands

with soap after cleaning child's excreta, immersing glass or tumbler is the most common practice to take out drinking water from a storage vessel, practised by 72% households and dumping solid waste in open space or street is the most common practice being used by most households, likewise disposal of liquid waste in open space or in unused water body is the most common and is practised by 54% households [17].The results of various evaluations reveal that the hygiene behaviours in Nirmal GPs have not sustained and people are reverting back to the unhygienic practices related to water and sanitation. Therefore a research was undertaken to assess the extent to which the key hygiene behaviours were sustaining in Nirmal GPs in Rajasthan and what measures need to be taken to improve the situation.

RESEARCH METHODOLOGY

The following key hygiene behaviours were assessed at the household level in randomly selected ten Nirmal GPs in ten districts of Rajasthan:

- Use of toilet by all family members.

- Hand washing with soap/ash by all family members at critical time's viz. before eating, after defecation, and after handling child's excreta.

- Proper storage and handling of water

- Proper collection and disposal of solid waste

- Proper disposal of waste water

The following research methods were utilized to assess the hygiene behaviours at household level:

- Household Survey Questionnaire in Hindi language was utilized to collect information at household level. The questionnaire covered all questions relevant to use of toilet, storage and handling of water, collection and disposal of solid waste, disposal of liquid waste, and hand-washing with soap/ash at critical times by all family members. The questionnaire was completed at each household through interaction with family members present at the time of survey. The structured-observations were carried out to co-relate and check the reliability of information collected through household questionnaire.

- Structured-observation method was used for observing behaviours as well as signs of behaviours,

signs of particular behaviour such as soap/ash and water present near toilet. The structured-observations are promoted as one of the tools that seem best adapted to the measurement of hygiene behaviours [18].The structured observations were followed by unstructured interviews with family members to assess the extent to which the each behaviour was practised by the family.

● Spot-checks were carried out to collect the information regarding the existing practice of each behaviour for example collection of solid waste, storage and handling of water, disposal of liquid waste, toilet in use. Spot-checks for observing indicators of hygiene are potentially rapid and efficient method for assessing household level hygiene [19].

● H_2S strip vials were utilized for testing the bacteriological quality of drinking water from the household water source and water pots. The water was collected in the H_2S strip vial direct from water source or stored drinking water and kept covered in the vial for 48 hours. If the colour of water turned black, it indicated bacteriological contamination. If the colour of water in the vial remained unchanged after 48 hours the water was free from bacteriological contamination under test conditions employed. The test measures the production of H_2S by its reaction with iron to form an insoluble, black precipitate. The test is simple and affordable and have great value for drinking water management and health education in water and sanitation sectors[20].

The above research methods were utilized in fifteen randomly selected households in each of the ten Nirmal GPs in ten districts of Rajasthan. In order to assess the score of each of the five hygiene behaviours in terms of percentage households practising the hygiene behaviour in that Nirmal GP, each hygiene behaviour was assigned a maximum score of 100 for each household provided it was practised by all the family members .The average of actual scores of all the fifteen households for each hygiene behaviour was shown as percentage households practising that hygiene behaviour in that Nirmal GP. The average score of each hygiene behaviour for ten Nirmal GPs in ten districts represent the percentage households sustaining that hygiene behaviour in all the Nirmal GPs in Rajasthan.

RESULTS AND DISCUSSIONS

The results of the assessments obtained by utilizing the above research methods in ten districts have been analysed and the district wise scores of all the five key hygiene behaviours in terms of percentage households sustaining each key hygiene behaviour in ten Nirmal GPs in ten districts of Rajasthan are given at Table 1:

Table 1: District wise percentage households sustaining five key hygiene behaviours

S. No.	Name of District	Name of Nirmal Gram Panchayat	Use of Toilet by all family members	Hand washing with soap/ash by all family members	Proper storage and handling of water	Proper collection and disposal of solid waste	Proper disposal of liquid waste
1.	Ajmer	Jamola	33	67	0	20	60
2.	Bundi	Basoli	67	80	20	80	67
3.	Churu	Somiasar	73	40	40	40	87
4.	Hanumangarh	Mulsisar	67	47	27	27	7
5.	Jaipur	Mahlana	67	53	0	40	33
6.	Jhunjhnu	Mohanbadi	73	73	33	67	33
7.	Karoli	Sakarwada	87	87	27	53	47
8.	Pali	Jhoontha	83	80	0	60	73
9.	Rajasamand	Piplantri	80	87	33	87	67
10.	Sikar	Magloona	67	73	47	87	80
	Rajasthan		68.7	68.7	22.7	56.1	55.4

The above results for each of the five hygiene behaviours reveal the following:

- In 68.70% households all the family members are using toilets and in remaining 31.30% households one or more members of the family defecate in the open, mostly men go for open defecation in the morning while going to field for work. In some households elderly men prefer to go for open defecation than using a toilet at home. The toilets are mostly build for privacy, dignity, security of women and children and elderly persons in the family but there is a lack of awareness about the health benefits of using a toilet.

- In 68.70% households all family members are washing hands with soap/ash at all critical times viz. before eating food, after defecation and after handling child's excreta. In 31.30% households one or more members of the family are not washing hands with soap/ash at one or more critical times.95% households use soap for washing hands and only 5% households use ash for washing hands .In 31.30% households mostly men use soil and water for washing hands after defecating in the open. Similarly while eating food at home or outside men wash hands with water only. There is a lack of awareness about the health benefits of hand-washing with soap or ash at all critical times.

- Only 22.70% households properly store and handle their drinking water. Those who properly store and handle the drinking water keep it in a covered container and draw water either by pouring or using long handle ladle. In 77.30% households the drinking water is not kept in a covered container and is drawn by dipping a tumbler in the water container. In 64% samples taken from drinking water container the bacteriological contamination was found on testing with H_2S strip vials confirming that the water gets contaminated during storage and handling at household level.

- 56.10% households properly collect and dispose their solid waste and remaining 43.90% households throw their solid waste outside the house or in a nearby drain. Nirmal GP at times arrange tractor trolley for removing and transporting the solid waste from streets to low lying areas away from the Gram Panchayat. There is no system for daily collection and disposal of solid waste and animal dung. The Nirmal GPs do not have technical knowhow and funds for developing, operationalizing and maintaining the solid waste management system in their respective GP.

- 55.40% households properly dispose their waste water and in remaining 44.60% households the waste water stagnates outside their houses. There is no system for collection and disposal of liquid waste and where the drainage system is partial it remains chocked most of the time due to lack of maintenance. The Nirmal GPs do not have technical knowhow and funds for developing, operationalizing and maintaining the liquid waste management system in their respective GPs.

CONCLUSION

It is evident from the results of research that none of the key hygiene behaviours is sustaining in hundred percent households in any of the Nirmal Gram Panchayat in Rajasthan and the sustainability of hygiene behaviours is a big challenge .The State Water and Sanitation Mission(SWSM) needs to develop an appropriate cost-effective, evidence based behaviour change communication strategy with clear and targeted messages for men, women, children and adolescent, and provide adequate funds, technical support and trained motivators to all the Nirmal GPs for its time bound implementation, monitoring and continuous follow-up. The state Education department should involve school children in child to child, child to parent and child to community communication in disseminating and reinforcing hygiene messages as part of School Sanitation and Hygiene Education (SSHE) strategy. SWSM should also provide technical and financial support to the Nirmal GPs to develop, operationalize and maintain the solid and liquid waste management systems, community sanitation facilities, and water quality surveillance and monitoring plan of actions, in partnership with the community based organizations involving the communities to ensure that the key hygiene behaviours are practised and sustained by all the family members of the hundred percent households in all the Nirmal GPs in Rajasthan.

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The Demographic Analysis of Private Label Consumer Durable Consumers in India

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ABSTRACT

Objectives: The private label brands, are the products which are exclusively available in retail chains and are slowly becoming popular and promising in India. This study contemplates three key demographic variables and the outcome of these on customer reactions to PLB Loyalty are assessed, the antecedents for brand loyalty are price, perceived quality, brand association, store image and a mediating variable customer satisfaction is used   for assessing the consumer's perception.

Method/Statistical Analysis: The research uses three demographic variables and its outcome on customer reactions relating to the attitude on brand loyalty of private label brands. The demographic variables used in our study are age, household income and occupation.

Findings: The findings reveal that perceived quality is one of the important predictors for brand loyalty of the Private label consumer durables. The results also reveal that older adults   of above 55 years with an household income of Rs.1,00,000 -Rs.1,50,000/month and are professionals and entrepreneurs by occupation are loyal to PL brands of consumer durables. These results will help the retailers to focus on their marketing efforts on other segments through social media -facebook, mail advertisements and in house promotions.

Improvements and Applications: This research helps us how the demographic variables like household Income, Age and Occupation has an effect on antecedents of Brand Loyalty of PL consumer durables. This research will have numerous managerial benefits to retailers and this article may appeal conceptually for academicians.

Keywords: *Private Label, Demographic variables, Retailers, MANOVA, Consumer Durables.*

INTRODUCTION

Private label brands has enjoyed and enjoying market expansion both in developed and developing economies. Even though they are very advantageous to the retailers they are viewed inferior to the national brands[1].

The purposefulness of this paper is to contour the private label brand consumers using demographic and attitudinal predictors. The research also aims to survey purchasers of private label consumer brands across three Indian brands consumer durables outlets.

This study particularly considers the relevant factors that customers take into consideration when planning the purchase   and repurchase of Private label consumer durables. This research explores whether various demographic segments of consumers vary in their views on brand loyalty of the consumer durable private labels.

Research Statement: This research endeavored to identify the demographic distinctions with respect to the attitudes of a private label branded consumer durables. The antecedents of brand loyalty are Price (relative price perception), Perceived quality, Brand Association, Store image, Customer Satisfaction. Moreover, a multitude of external factors influencing the consumers's view of the PLB merchandise (Brand Loyalty) were also captured and subjected to MANOVA analysis. In this regard, segmentation clusters of age, household income and their occupation were demarcated and associated   using the attributes mentioned here.

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Review of Literature: The antecedents for brand loyalty of private label brands. At the heart of this research is the conceptualization   of the brand loyalty for private labels is based on brand equity contributed by the researcher[2].This theorization has further been substantiated and validated by the works of [3,4,5,6]. The antecedent factors for brand loyalty are processed to formulate a notion of customer satisfaction.

Segmentation Analysis: Segmentation analysis will enhance the retailer to improve his competitive advantage [7]. This is often achieved according to age, education level and socio-economic status [8,9].Fragmenting the sample based on socio economic status leads to noteworthy and appreciable findings, which might otherwise will be disguised if the demographic variables are used in our study[8]. The following studies has addressed the above issue:

● Scrutinized how demographics has an effect on perceived risk in Purchasing of private labels in South Africa[10].

● Private labels purchasers can be described by their household size and income in United States[11].

● Behavioral characteristics like low bargaining power is seen in higher income households and vice versa in U.S for private label apparels. Findings indicate demographic predictors as important drivers of private label apparel purchase among retailers positioned as providers of value, while behavioral drivers are more common among patrons of retailers that are differentiated on service or brand[12].

● Old, youth, high income and higher education show a positive attitude towards private label in U.K[13].

● Socio-demographics of private labels purchasers have lower incomes, higher deal-proneness and believe less in price-quality association in U.S[14]

● We conclude that the Income of the consumer plays an important role in the private label purchase in Taiwan[15].

Thus from the above literatures we are able to find out how demographic variables can differentiate the consumers behavior with respect to purchasing the private label.

METHODOLOGY

Data Collection: The data was collected from respondents inside the retail stores. Simple random sampling was used to collect. The questionnaire was administered to the sample after they have purchased the Private label product.

Data Analysis: The process of analysis starts with the data which is tested for its normality. The parametric test MANOVA was used for the demographic variables of household income, occupation, age, along with predictor variables for brand loyalty. The constructs were found to be adequate reliability with a value above 0.7.

Composition of respondents: The realized sample of 500 respondents are from Chennai metropolitan area. Three distinct segmentation variables were collected-age, household income, Occupation. The sample   is skewed towards males (67.4% males and 32.4% females), young adults in the age group of 26-35   years are 22.4%, household income less than Rs.50000 /month are 24%, and salaried people are 43.8%.

RESULTS

In this part of the research article, segmentation by age, household income is considered, using the analytical techniques briefed above. In order to understand if perceptions related to a consumer's notion of brand loyalty and the antecedents thereof (namely price, perceived quality, brand association, store image) were subject to variations on the basis of demographic variables, construct wise analysis was taken.

H_0: The means of all the segmentation groups are the same.

H_A: The means differs significantly from the other segmentation groups.

DATA ANALYSIS

Multiple comparisons based on AGE groups

Multiple comparisons based on age groups-Tukey Subsets: Individual constructs are discussed on the basis of homogeneity subsets and means with the demographic variable age groups of the respondents.

Multiple comparisons based on age groups
Brand Association- Tukey HSD

Table No. 1: Shows the Age and Brand Association Subsets.

Age	N	Subset		
		1	2	3
Above 55 Years	126	3.7778		
Between 36-45 Years	103	3.8835	3.8835	
between 26-35 Years	112	3.9286	3.9286	3.9286
Between 46-55 Years	78		4.0513	4.0513
Less than 25 Years	81			4.1728
Sig.		0.464	0.352	0.059

The table 1 shows that there are 3 subsets for the construct brand association. The age groups above 55 years and less than 25 years significantly differ from each other on their opinion on Brand Association.

Age and Perceived Quality subsets
Table No. 2: Shows the Age and Perceived Quality subsets

Age	N	Subset	
		1	2
Above 55 Years	126	3.8333	
Between 26-35 Years	112	3.9107	3.9107
Between 36-45 Years	103	3.9612	3.9612
Less than 25 Years	81	4.0123	4.0123
Between 46-55 Years	78		4.1538
Sig.		0.29	0.062

The above table 2 on perceived quality constructs show 2 homogenous subsets. This shows that the age groups above 55 years and between 46-55 years differ in their opinion on perceived quality construct of private label brand.

Table No. 3: shows Age and Customer Satisfaction subsets
Customer Satisfaction-Tukey HSD

Age	N	Subset	
		1	2
Above 55 Years	126	3.7778	
Between 26-35 Years	112	3.9375	3.9375
Between 36-45 Years	103		4
Less than 25 Years	81		4.0988
Between 46-55 Years	78		4.1154
Sig.		0.228	0.14

The table 3 shows the 2 subsets for the construct customer satisfaction. The age groups above 55 years, Between 36 - 45 Years, Less than 25 Years and between 46-55 Years significantly differ in their perception towards customer satisfaction of private label consumer durable products.

Multiple Comparisons based on Income: Tukey HSD

Tukey Subsets based on Income of the respondents: The tables below show the income subset posthoc results.

Table No. 4: shows Income and Brand Association Subsets
Brand Association- Tukey HSD

Monthly Income	N	Subset	
		1	2
Between 1,00,001-1,50,000	118	3.6271	
Between 50001 - 1,00,000	101		3.9703
Between 1,50,001 - 2,00,000	87		3.9885
Above 2,00,000	72		4.0417
Less than 50,000	122		4.123
Sig.		1	0.454

The table 4 shows income group between Rs 1,00,001 -1,50,000 differs significantly with the other income groups (Between Rs 50001 - 1,00,000, Between Rs 1,50,001 - 2,00,000, Above Rs 2,00,000, and Less than Rs 50,000) which are homogenous among themselves in their perception towards the construct Brand Association.

Table No. 5: shows the Income and Perceived Quality subsets
Perceived Quality- Tukey HSD

Monthly Income	N	Subset	
		1	2
Between 1,00,001-1,50,000	118	3.7034	
Between 50001-1,00,000	101	3.8812	3.8812
Between 1,50,001-2,00,000	87		4.069
Less than 50,000	122		4.082
Above 2,00,000	72		4.125
Sig.		0.299	0.062

The table 5 shows the 2 homogenous sets of the income of the respondents. The income group Between Rs 1,00,001-1,50,000 differs significantly in their preference of perceived quality construct of PL consumer durable with homogenous set 2 which comprises of Between Rs 1,50,001-2,00,000, Less than Rs 50,000, and Above Rs 2,00,000

Table No. 6: Shows the Income and Customer Satisfaction
Customer Satisfaction-Tukey HSD

Monthly Income	N	Subset	
		1	2
Between 1,00,001-1,50,000	118	3.7797	
Between 50001-1,00,000	101	3.901	3.901
Above 2,00,000	72		4
Between 1,50,001-2,00,000	87		4.0575
Less than 50,000	122		4.1066
Sig.		0.511	0.059

The table 6 shows two subsets of income groups which are significantly different from each other. In these two subsets Between Rs 1,00,001 - 1,50,000 differs from Above Rs 2,00,000, Between Rs 1,50,001 - 2,00,000, Less than Rs 50,000 with respect to their perception on customer satisfaction of Private Label brand.

Multiple comparisons based on Occupation

Multiple comparisons based occupation-Tukey subsets

Table No. 7: shows Profession or Type of Customer and Brand Association
Brand Association- Tukey HSD

Type of customer	N	Subset	
		1	2
Professional	92	3.75	
Salaried	219	3.8858	3.8858
Retired	35	3.9429	3.9429
Business	78		4.1154
Home Maker	76		4.1447
Sig.		0.364	0.107

The table 7 shows the 2 Tukey subsets for the brand association construct. There is a significant difference

between subset 1 and 2 between professional in subset 1 and business, homemaker in subset 2 regarding their perception on Brand Association of Private Label consumer durables.

Multiple comparisons based on profession or type of customer-Tukey subsets

Table 8: shows Profession or Type of Customer and Customer Satisfaction subsets
Customer Satisfaction- Tukey HSD

Type of customer	N	Subset	
		1	2
Professional	92	3.7935	
Retired	35	3.8857	3.8857
Salaried	219	3.9452	3.9452
Home Maker	76		4.0921
Business	78		4.1282
Sig.		0.433	0.052

The table 8 shows two subsets for the type of respondent. Their perception on customer satisfaction of PL varies significantly between professional of subset 1 and business and homemaker in subset 2.

Conclusion and Managerial Implications: The research contemplates the demographic distinctions with respect to the antecedents of the attitude of brand loyalty of private label consumer durables in India.

The antecedents like price, perceived quality, store image, brand association for customer satisfaction and brand loyalty are probed. Moreover, the demographic factors influencing the consumer's view on private label brand loyalty were captured and subjected to analysis. The main predictor for brand loyalty was found to be the perceived quality. The segmentation nuggets of age group, household income and Occupation were identified and compared against each other using the antecedents specified above. With respect to age, three out of five legions show similar response patterns. The older customers are receptive and has a positive inclination towards Private label products. They also feel that there is quality in Private Label Consumer Durable products and are loyal to them. This is apparently due to their declining nature of their income. The elderly people are savvy shoppers who look for value for money[16]. This is with the age group of above 55 years. The reverse scenario exists with younger consumers.

Harmoniously, with respect to household income, the legions exhibited broadly similar response patterns with respondents. The household with high income deviated from the results, appearing to possess a more negative attitude towards the private labels by assessing the price and quality of the merchandise to be not up to the snuff. The consumers with low and medium income were more price conscious and compared prices in a couple of shops and chose low priced products[17].

Lastly, in terms of the occupation of the consumers we find the salaried and entrepreneurs are in approval of the private label brands. The retailing in India is only now becoming organized. The salaried consumers are the main purchasers of PL Consumer Durables. They are able to differentiate the stores based on their positioning.

It has been observed that the demographic profile of customers were found to influence the perception positively leading to a repeat buying process. This suggests scope for improvement in specific demographic clusters. The older savvy consumers are positive towards private labels and are loyal. Hitherto, the affluent households with better income and the younger (25 -45 years) working individuals and housewives are impervious to private labels. The latter legion provides a clear opportunity to change perceptions. They can be reached through social media channels and lot of in house promotions are necessary. The study also suggests to improve the perceptions of perceived quality of the private label brands[18].

Limitations of the study: This study concentrated on a private label branded consumer durables in analyzing the consumer responses to a number of different product characteristics, segmented by demographic clusters. In doing so, a number of limitations were forced. Primarily small appliances and both large appliances were studied together. Secondly, the study is contextualized to the Indian retail sector. Results may differ in other markets and may also be affected by the product category and choice of brand placed under the microscope.

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Conflict of Interest: Nil

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Determinants of Implementation of Bureaucracy Behavior in Health Service in Community Health Center

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ABSTRACT

Health services is a very fundamental thing for people living in both rural and urban areas, including Makassar. The performance of bureaucracy in conducting public services is characterized by unprofessional bureaucratic behavior. This study aimed to determine the factors related to implementation of bureaucracy behavior in community health service (Puskesmas) supporting the process of public service delivery. This research was qualitative study and obtained data by observations, interviews, and documentations. The selected informants consisted of the bureaucrats in Puskesmas as the provider and the people in the community as the users of the services.

This study showed there are three factors closely related to the implementation of bureaucratic behavior in service provision to the community, namely leadership, professional bureaucracy, and special authority. All these factors mutually support the process of the service provider, but it was not optimally implemented. In conclusion, in implementation of bureaucracy behavior, the related factors should be optimized and strengthened with a commitment by government in recruitment system, such as competitive, transparency, and free from political matters.

Keywords: *bureaucracy, Public Health Center, leadership, special authority*

INTRODUCTION

The success of health development is supported by the successful development of the administration[1]. The success of administrative development is seen from the behaviors that are capable of carrying quality bureaucratic behavior in fulfilling public satisfaction. The success key of public service administratively lies on bureaucracy behavior which sided to public[2]. The core of bureaucratic behavior[3] is a service to realize the satisfaction of bureaucratic behavior. Referring to Berger's view[4] that the bureaucratic behavior that embodies a good public service must conform to aspects of universal rational action, hierarchy, and discretion.

Concerning the concept of good governance, the quality of public services requires a decentralization of

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authority, bureaucratic professionalism with the ability to innovate. But the service paradigm in the practice of public service delivery failed. Bureaucratic failure to run the mission of public service is not clear and often ignore the changes occurring in the environment. Adherence to rules and procedures is the dominant performance indicator so that the courage to take initiative in responding to changes in society is very low. In general, bureaucratic officials have not been able to place bureaucratic service users as customers who have the ability to improve their own destiny and bureaucracy[5].

Research on the condition of public services, especially basic Public Health or Public Health Centers[6], found that the transformation of bureaucracy that took place as organizational changes according to healthy Indonesian objectives was not expected because the element of change has not been applied effectively. As a result, health care with low quality. This study aimed to reveal the extent of factors related to the implementation of bureaucratic behavior that takes place in Community Health Center.

RESEARCH METHOD

This was qualitative study approach conducted in Community Health Center in Makassar Municipality. The Community Health Center were selected purposely which represent urban and sub-urban areas. Informants consisted of two major groups. First group represented public service provider, namely staff of Community Health Service, local government and district health office staffs. The second group stemmed from people in community as service user.

The data processing was performed by four stages: a) the data collection. B) data reduction, C) data testing, D) drawing conclusions from interpretations made in the form of answers from problems. Then the results of research findings are checked through the criteria, namely credibility, transferability, dependability, and confirmability.

RESULT AND DISCUSSION

The bureaucratic behavior of the government applied by the bureaucratic apparatus of the Public Health Centers in Makassar City can be done either by principally in the rational principle of universal, hierarchy and discretion, but not maximally carry out the Public Health. Therefore, bureaucratic behavior can be innovative and coordinative[7].

The application of bureaucratic behavior is a form of interaction between individual characteristics and bureaucratic characteristics as reflected in the growth of bureaucracy that performs governmental service tasks (service provider) with the service user community (service recipients). Aspects that support bureaucratic behavior in the Public Health Centers in Makassar City are the factors of leadership, professional bureaucracy, and the existence of special powers. These three factors support each other to implement public service. However, to improve effectiveness and efficiency, it is necessary to consider innovative aspects in service programs, improve the principle of coordination vertically and horizontally and empower the organization to the community so that the program objectives can be achieved optimally.

Leadership: Leadership is defined as the ability and skills of a person who occupies the position as a leader of the work unit to influence the behavior of others, especially subordinates to think and act[8]. This role is applied as a service provider to subordinates and guide them to make changes.

The ability of service bureaucracy in implementing its role in managing public services according to the aspirations and needs of the community is expected to have the characteristic bureaucracy to transform the values, principles, and entrepreneurial spirit into bureaucratic institutions. Fundamentally, bureaucratic change strategy is not easy to implement, given the vast and complexity of bureaucratic organization issues. Changing the direction of bureaucratic service performance based on organizational vision, it takes bureaucratic leaders who are able to encourage the spirit and change the influence it has to achieve the goals of bureaucratic organizations.

Bureaucratic changes related to the idea of reinventing government[9] related to improving the quality of public services with empowerment strategies in 3 dimensions of organization empowerment, employee empowerment, and community empowerment). The three dimensions of empowerment are basically to open up the sphere of authority as administrative decentralization, capacity building and employee performance, and encourage community participation.

In the conduct of public services, the poor bureaucracy organization performs its function depends on the way the leader moves and affects subordinates. Leadership skills appear in their behavior to be leaders who can support the success of future institutions. Leadership is closely related to the leader's power to influence the behavior of his followers both individually and in groups to achieve goals. The ability of bureaucratic leadership to make changes in performance that has been run into the expected performance of the community has not been responsive in the use of technology.

Strategies for creating changes in the public bureaucracy can be done on all aspects of bureaucracy, because the goal of change is to obtain efficiency, effectiveness, and improve the ability to innovate. Combining these three things requires the leader's ability to collaborate, meaning that combining efficiency, effectiveness and innovation requires a change in leadership. To support the change, it is advisable to take advantage of the bureaucratic mechanism that has been implemented[10]. The process of change by leaders is done by: 1) raising awareness of employees about the value

and importance of tasks and work, 2) directing them to focus on group and organizational goals rather than personal interests, and 3) developing their potential as optimally as possible.

The right strategy to optimize public services in Lauer's view is through the adoption of program innovation[11] which will show a social change in the lives of individual people. Non-optimal Public Health in Makassar city are because of the service activities provided by officials/apparatus of service that have not been in accordance with the wishes of the community. Recent global developments have led to increasing changes in various dimensions of life such as technology, training of educated personnel, the global economy.

Professional Bureaucracy: The existence of bureaucracy can provide quality public services, while the success of bureaucratic reform by making changes, especially in service is determined by the quality of public services. On the other hand, good bureaucracy is based on the embodiment of professional bureaucratic apparatus. Professional bureaucracy as the expected demands are met by everyone who pursue work. Siagian[12] states that professionalism is often interpreted narrowly if it is aimed at certain groups such as leaders and employees whose activities are scientific. But, a job is actually a profession as well. Professionalism is also required of every person who works, regardless of his work. Working professionally implies that one really understands the details of the task.

Public Health programs require the ability and skill of officers that are not yet equal to the available workload. There are tasks handled by sections that are not their areas of work. Theoretically, this principle contradicts the concept put forward by Hadari[13], that a coordinated organization should not occur one unit/unit of work taking over the volume of work of another unit, and vice versa, there should be no person or work unit personnel leaving or working on the workload which is their responsibility.

The adoption of professional bureaucratic behavior with its principles demands the work performed by the apparatus of increasingly demanding expertise in depth, in other words, the expertise in the field of duty is increasingly needed. The power of this concept according to Mintzberg[14] is at the core of operations, i.e. employees who carry out basic work related to

production and service activities because they have the critical skills required by the organization. Therefore, these employees have the power of decentralization to apply their expertise.

The ability and skill of officers in handling the Public Health programs have not been reached optimally, especially in the effort of preventive and promotive public service. Excessive workload is not balanced with the number of officers, so the implementation of Public Health seems less well coordinated. The occurrence of a high and uneven workload is the result of weak coordination.

Coordination is needed as a basic matter in basic services so that work can run successfully. There is no gap and duplication in the implementation of activities. In addition, good coordination will build communication channels between sections with elements of stakeholders. Coordination has not been effective if it has not been supported by bureaucratic placement that has the more technical capability, either on curative service, or preventive and promotive.

To achieve maximum results an organization required a balance between task, authority, and responsibility. Each ministry should involve all functions within the organization structure. This means that no matter how much any workload if in the implementation carried out a clear division of tasks accompanied by the appropriate delegation with a sense of responsibility, the appropriate professional bureaucracy can perform quality services according to community expectations.

Optimizing the quality of service will not be achieved if the hierarchical principle in applying the behavior of service of Public Health Center (Puskesmas) in terms of a clear division of tasks, appropriate delegation with responsibilities, not in line with the concept of "professional bureaucracy" applied in the process of Public Health activities.

Specific Authority: In an authoritarian system of government demonstrates the phenomenon of the transfer of power originally dominated by the central government and now the power is in the hands of local government officials better known as the decentralization of power. The results of a study indicate that some of the authority received by Public Health Centers in general are still centralized. A top-down kind of policy has not given the Public Health Centers the freedom to organize

themselves. The existence of Public Health Centers that have a strategic role in strengthening the public health status does not seem to have wide authority to strengthen Public Health Centers independence in an effort to empower the community so that Public Health Centers is difficult to play its role.

One of the consequences of the implementation of regional autonomy is decentralization, which has changed most of the order and function in the health system due to the transfer of power from central to regional, district and municipal governments have great authority to manage natural resources, funds, and people. This role affects the health policy process in the region according to the conditions of the region concerned. District health offices in the pre-reform period only functioned as policy implementers, but nowadays it should act as a manager and policy maker[15].

The implications of decentralization make the wider choice of policies made at the local level. Relation to policy, the use of power and leniency secreted in the bureaucracy becomes important to be applied so as not to impede the system of government, one of them is public service. The previous mistake, the widespread discretion authority has been the trigger for abuse of power, so the government took the path by making solutions, where the bureaucracy is encouraged to reduce discretion while public accountability is intensified.

A behavior of bureaucracy in Public Health in Makassar City is strived to apply the principle that the application of discretionary authority will facilitate the implementation of Public Health, but because some implementation problems have not been optimal to reach Public Health, according to development, target a healthy paradigm[7]. It is acknowledged that the centralized policy still dominates so that the real needs according to conditions have not been met as the expectations of society.

The bureaucratic discretion authority is required to improve the quality of public services. In line with conventional democratic views, discretion needs to be limited by various parameters in both internal and external contexts, so that discretionary application is related to the responsibility and accountability of the public bureaucracy.

Specific authority for a lower level health agency (street level bureaucracy) such as Public Health Centers are still needed because of the importance of eradication of a disease that has recently increased its intensity. Public Health bureaucracy apparatus in exercising discretionary authority seems not yet optimal enough. The received authority is still limited by the rules that apply, there are still bureaucratic apparatus who do not have the creativity in outlining policy rules to reduce the rigidity in doing the service. Public Health Centers as basic service institutions that run the functions of the community empowerment program should open a communication channel to provide opportunities for stakeholders to participate in the development process by initiating the implementation of community-based programs[16].

CONCLUSIONS

Optimizing leadership factors, professional bureaucracy, as well as special powers can improve the capacity of public service bureaucrats through self-development in terms of technical administrative skills and technical medical skills. In addition, the government is expected to have a commitment in the system of recruitment of apparatus resources in a competitive, open, and free from political influence. Public Health require specific tasks and responsibilities to maximize community interests by fostering public trust and expanding the discretionary authority as needed. Leadership in service has been implemented but has not been fully effective because the bureaucracy in terms of performing service tasks is less oriented to change.

Bureaucratic behavior can be optimized by noticing the strategy of providing public health service with a strong leadership. To expand and enlarge the authority by granting special authority to the Public Health Centers can be done by affirmation of delegation of authority and responsibility to appropriate and professional apparatus, develop the quality of resources and professionalism of existing apparatuses, and support the growth of innovation and new initiatives from the apparatus bureaucracy.

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Recent Strategies and Patients Preferences of Community Pharmacists Asthma Service

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ABSTRACT

Asthma control depends on the accessibility of effective medicines and its appropriate use. Given that many issues in the asthma management are related to inappropriate use of medication, community pharmacists are in the excellent position to improve asthma outcomes. This review aims to summarize recent strategies of community pharmacists asthma services and patients' preferences on such program. Various servicessuch as medication use review, patients counseling, inhaler training, telephone consultation, SMS reminder, dispensing data screening, and small group discussion were shown to have positive impacts on clinical outcomes, adherence to medication, and quality of life of the patients. Limited evidence showed that these services were beneficial in economic perspectives. Patients preferred these aspects included in suchprogram; protection of their privacy during the program, positive attitudes of pharmacists, and various useful services including education on asthma, adherence review,and lung function testing.

Keywords: *asthma, pharmaceutical care, community pharmacist, patient preference*

INTRODUCTION

Asthma remains a major health problem worldwide.[1] Approximately 300 million people were affected by this chronic disorder.[2] It poses significant clinical and economic burden to the patients.[3,4]

Despite high quality of available medicines and its regimen that is being simplified on a regular basis, asthma is still not sufficiently controlled in many patients.[5-7] The major issue in the pharmacotherapy of asthma is the inappropriate use of asthma medication,including incorrect inhaler technique,[8] overuse of short-acting medication,[9] and low compliance to the long-term controller medication.[10]

Community pharmacists have a potential role to manage medication use related problems in chronic diseases with their expertise and frequent contact with patients during prescription refills.[11-13] However,it has been recognized that the expertise and skills of community pharmacists are frequently under-utilized.[14,15] With different workflow between community and clinical pharmacy practice, there are several challenges in providing community pharmacy-based pharmaceutical care programs, including limited access to patient medical information, challenge in recruiting patients at the counter for cognitive service, and challenge in integrating interventions to normal community pharmacy workflow.[16,17]

Therefore, it is important to identify recent strategies of community pharmacy-based asthma care. Besides, insight on patient preferences for such service is also crucial, thus pharmaceutical care programs can be designed to match these preferences, rather than around health outcomes viewpoints alone. Several systematic reviewshave studied pharmaceutical asthma services. However, these reviews either only focused on one outcome or sum marized multiple intervention programs by several health care providers.[18–24]

The aims of the current review were to summarize recent strategies of community pharmacists asthma care and patient preferences on such program.

METHOD

The literature search was conducted using three databases: PubMed, Embase and International Pharmaceutical Abstracts (IPA). Search strategies were formulated for each database using the following keywords: asthma [title/abstract] AND ("pharmaceutical care" or "pharmacy service" or "pharmaceutical service"

or "community pharmacy"or "community pharmacists" or "pharmacists" or "pharmacy"). We included studies assessing the effectiveness of community pharmacists asthma service and patients preferences for such program. We excluded review articles, trial protocols, and non-English studies. From each included study, general characteristics, description of program and patients preferences on such program, and outcomes measured were extracted.

RESULT

Study Selection: The initial search resulted in 3127 records which then were screenedusing the filter tool in each database. 153 potentially relevant abstracts were then assessed based on eligibility criteria, resulting in 49 potentially relevant articles. The assessment of the full-text of the articles yielded25 included studies.

Community Pharmacists Asthma Serviceusing Standard Strategies: Seven studies assessed the effectiveness of community pharmacists program using standard strategies, in which usual direct patient education andcounseling were performed.[26,27] The counseling covered various topics such as education on inhaler technique, knowledge about asthma; lifestyle issues; review of medication use; lung function testing; allergic skin testing; and referral to general practitioner.[28-34] The studies showed that these services improved various clinical outcomes, such asasthma severity, the forced expiratory volume(FEV_1), inhaler technique, adherence to medication, use of β2 agonists,[28-32,]34and humanistic outcomes,such as quality of life, asthma knowledge, and nighttime awakening.[28,29,31-34]

Community Pharmacists Asthma Service using InnovativeSrategies: Eleven included studies assessed

the effectiveness of community pharmacists service using innovative strategies. This kind of strategies are relatively new, or specific for certain population, or useful to address the challenge in integrating asthma service into normal community pharmacy workflow. It included the provision of rural asthma service, daily SMS reminder, telephone consultation, dispensing data screening, inhaler training with various training aid which can boost adoption of right inhaler technique, and small group discussion approach.[35-45]

In clinical perspective, these strategies were shown to have impact on asthma severity score, inhaler technique, improvement in preventer:reliever (P:R) ratio, the use of oral high dose corticosteroid, and drug-related problems.[35-38,40-45] These services could also beneficially influenced quality of life and knowledge on asthma.[37-39,42,45] Cost saving and incremental cost effectiveness ratio were also improved with the implementation of these program.[42,45]

Patients Preferences on Community Pharmacists Asthma Care: We identified seven studies that assessed patients' preferences on such program. Several methods were used to collect preferences, including semi-structured interviews, self-administered survey, focus groups, and mailed discrete choice questionnaire.[17,46-51]

Our review underlined the importance of (1) protecting patients's privacy by conducting the intervention in separate area other than pharmacy counter, (2)maintaining positive attitude towards patients, (3)providing services needed by patients.[17,46-51] One study showed that the provision of asthma service was associated with an increased in the loyalty of patients to certain pharmacy.51Related to the future services, oneincluded study found that there was still a dichotomy of views, while some patients wanted fewer and others wanted more direct visits.[46]

Table 1: Patients preferences on community pharmacists asthma service

No.	Study Characteristics (Author/ Year/Location/Method)	Patient Preferences on Pharmacists Asthma Service
1.	Kaae/2015/Denmark/semi-structured interview.[17]	-Private room for consultation/protection of privacy -Positive attitude of pharmacists
2.	Naik-Panvelkar/2015/Australia/interview and focus group discussion.[46]	-Education on side effects of medications -The provision of action plan -Inhaler technique assessment. -Positive attitude of pharmacists
3.	Kong/2014/Australia/survey.[47]	-Information on choice of medication available -Education on asthma triggers and self-management
4.	Naik-Panvelkar/2012/Australia/discrete choice questionnaire.[48]	-Provision of lung function testing -Private room for consultation -Positive attitude of pharmacists -Comprehensive education about asthma

Contd…

5.	Bereznicky/2011/Australia/semi-structured interview.[49]	-Quick dispensing process -Education on medication use
6.	Naik-Panvelkar/2010/Australia/semi-structured interview.[50]	-Comprehensive education on asthma -Positive attitude of pharmacists.
7.	Portlock/2009/United Kingdom/questionnaire.[51]	-Medication use review program -The program should be quick, easy, and worthwile

DISCUSSION

Education on inhaler technique: Education on inhaler technique is one of the primary community pharmacy asthma services. The methodof education played an important role in the outcomes improvement. The provision of written procedures alone resulted in very low rates of correct inhaler technique.[52] Another study revealed that combination of both verbal instruction and physical demonstration was more effective than standard verbal counseling alone.[36]

To help boosting patients' adoption on correct inhaler technique, various innovativestrategieswere introduced, such as;the provision of interactive visual inhalation measurement feedback,[35] the provision of audio-interactive training aid device.[37] and personalized novel inhaler technique labeling.[43]Addition of such strategies could yield greater magnitude of improvement compared to standard care.[35,37,41] In particular, the personalized instruction labeling on inhalation device might be feasible to be adopted in pragmatic service since it has high potential to trigger sustainable improved behaviorwith very minimal burden to thecommunity pharmacy workflow.

However,several studies found that knowledge and skills of pharmacy member in performing correct inhaler technique were suboptimal.[53–56] Proper training should be conducted prior to the implementation of the service to ensure that this intervention could lead to the improvement.

Dispensing data screening: Community pharmacists could target patients with suboptimal pharmacotherapy for counseling by conducting the screening on dispensing data.[36,40] Using various prescribing markers as signals on suboptimal medication use, (e.g., P:R ratio, co-medication pattern) these studies showed that targeted counseling for these patients were effective in improving clinical outcomes. These results were similar with another studies performed dispensing data screening of tuberculosis patients[57]. This approach represents "right-on-the-target" strategy.

However, this strategy also has limitation. Incomplete and outdated data is one of the barriers in implementing such approach. Another study by Floor-schreudering et al showed that incomplete electronic patient records could lead to failure in the generation of drug therapy alerts.[58] Furthermore, in several countries, patients could refill the prescriptions in any pharmacies, making it difficult to have complete dispensing data if national dispensing database was not yet established. Particular strategies should be designed to support successful implementation of this approach.

Text messaging service and telephone consultation: Pharmacists could embrace the use of technology to enhance pharmaceutical care. Daily text messaging service from the pharmacy, which included twice-a-day personalized reminder and education related to asthma medication use was effective in improving the outcomes.[38] Communicative interaction still could be maintained in such service by allowing the patients to reply the message and ask anything related to medication problems.Other studies showed that SMS reminder could lead to the improvement in adherence to take medication in HIV,[59] diabetes,[60] and hypertension patients.[61] Such reminder service is beneficial, particularly for chronic diseases, in which the adherence is one of the key factor for successful pharmacotherapy.

Telephone consultation service could also be the alternative method in pharmacy asthma service. Several included studies showed that telephone consultation could improvedpatients outcomes.[39,41,44] The use of patient centered focus-approach in telephone consultation, allowing patients to explore their barrier in managing asthma by theirself, was recommended.[44]

Patients preferences on community pharmacist asthma care: Patients often expressed a desire to receive asthma care in a way that respects their privacy,

thus the pharmacy should have separate area other than the counter to facilitate private counseling.Protection of privacy was also reported as an important factors affecting satisfaction on pharmaceutical care in mental health illness[62] and sexual health.[63]

Patients valued various useful pharmacy asthma service, including education on asthma, medication use review,allergic testing, lung function testing, etc.[46-48,50] They also prefer clear explanation with demonstration (on medication use), if necessary.[51] Availability of variety of these services would attract patients to participate in such programs.

However, several studies also found that many patients often felt little need to receive asthma service from community pharmacists since they thought they already knew how to do correct inhaler technique or they accepted that they would have asthma symptoms throughout their life.[17,49] It was supported by finding from another study which found that patients with asthma tend to under-estimate their asthma severity and thus felt little need to receive the intervention.[64] Patients eventually were willing to receive pharmacists asthma care because of the positive attitude of pharmacists towards them.[17] Therefore, pharmacists should maintain positive attitue towards patients, e.g., by showing sympathy, caring, and friendliness to ensure successful recruitment of patients for asthma service.

Another finding is that many patients had low expectations of pharmacists capability or unaware of additional pharmaceutical care that pharmacists can provide.Much work is still needed to increase public awareness and acceptance of community pharmacists asthma service.

CONCLUSION

Various strategies were utilized in the community pharmacy-based asthma service, including standard and innovative pharmaceutical care. These services could beneficially influence treatment outcomes. Protection of privacy, pharmacists' positive attitude, and various useful asthma services were among the key aspects that patients thought should be considered when implementing such programs.

Ethical Clearance: no ethical clearance required to conduct this literature review.

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Determinant Implementation for Living Baby and Children Health Program in the Makassar City

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ABSTRACT

Background: This study studied infant mortality rate in South Sulawesi Province, is still relatively high and has not met the MDGs targets. Based on data of SDKI 2012, Infant mortality rate in South Sulawesi in 2011 amounted to 25/1000 live births. This figure still does not meet the target of the national medium-term development plan until 2014 of 24/1000 live births. Analyzing the influence of social factors; economics and implementation of maternal health programs and Children against the survival of Toddlers in Makassar City.

Materials and Methods: In this research, research design used is *combined method* between quantitative and qualitative approaches. Researchers can take a quantitative approach against the sample of the population, followed by observations and interviews with limited informants.

Results: Demographic characteristics that affect infant mortality are education and parental behavior. And components of the implementation of maternal and child health programs on the sustainability of children under five years of age in Makassar that have influence that is communication, bureaucratic structure, and disposition.

Keywords: Living baby, children health, survival toddlers

INTRODUCTION

One indicator of the success of development in the field of health is the decrease in infant mortality rate and children under the age of five[1]. Infant mortality rate in South Sulawesi Province (Sulsel) still relatively high and has not met the MDGs targets. Based on data of SDKI 2012, Infant mortality rate in South Sulawesi in 2011 amounted to 25/1000 live births.[2] This figure still does not meet the target of the national medium-term development plan until 2014 of 24/1000 live births.[3]

Makassar as the capital of South Sulawesi province is the largest contributor to infant mortality compared to other regions or districts in South Sulawesi. Infant mortality rate in Makassar city in 2013 amounted to 6.71/1000 live births, with a total of 165 deaths from 24,576 live births.[4]

Tri Arifah Ashani and Abdur Rofi [5] conducted research on the cause of high infant mortality with the title "*Infant Mortality According to Demographic and Socio-Economic Characteristics of Households in West*

Java Province (Data Analysis Sdki 2007)". The results of this study explain that the demographic characteristics that affect the infant mortality is the age of the mother, and the age of first marriage, while that does not affect the infant mortality is the number of child births, maternal education, and mother activities and who have the strongest connection is the age of the mother.

While our research is to analyze the influence of socio-economic factors to be studied and need more attention because infant mortality rate in Makassar is still considered high enough.

MATERIAL AND METHOD

The research method used is a quantitative research method. Quantitative research is a type of influence test, a research conducted to examine the effect of a research phenomenon in terms of the presence of variables at or after the occurrence of phenomena.

In this study to see the effect between two variables using chi square test and to test how much influence

between several variables together with using multiple logistic regression analysis test. Then, data from some populations or samples is collected directly from the research object. This data collection aims to determine the responses or opinions of some populations of the object under study. This quantitative research is also included in the type of survey research, ie research conducted on large or small populations, but the data studied is data from samples taken from the population. The hypothesis of this study is that socio-economic characteristics are associated with infant mortality,[6] because the better the quality of socioeconomic the infant mortality rate is getting smaller. And the implementation of maternal and child health programs against the survival of infants has to do with the infant mortality rate, because the better the service then the infant mortality rate is getting smaller.[7]

RESULTS AND DISCUSSION

Influence the characteristics of mother to the survival of infants in the city of Makassar: Research respondents are the object of research given questionnaire where the qualification of this object is determined based on domicile in Makassar City, have children under five and have access to health service of mother and child. Based on the research result of respondent proportion based on mother age is described in following table.

Table 1: Distribution of Respondent Characteristics Based on Proportion of Age in Makassar City

Mother's Age	n	%
<20 Year	84	21.7
20-30 Year	267	69.0
>30 Year	36	9.3
Total	**387**	**100.0**

Based on table 1, the proportion of respondent's age varies where the lowest age is mothers who have above the age of 30 years as much as 9.3%, while the highest is the mother who has age between 20 to 30 years as much as 69.0%.

From the bivariate analysis, the influence of education on the survival of children under five shows the level of maternal education affecting the survival of children under five in this case a mother whose education level enough then will determine the care and attention to the child.

Table 2: Analysis of Maternal Education, Mother Behavior, Economic Sources on Infant Mortality in Makassar City 2017 and & Analysis of Environmental Condition Modeling on Death Infant Toddler in Makassar City 2017

| Education Mother | Infant and child mortality under 5 years | | | | Total | | P Value |
| | Yes | | No | | | | |
	n	%	n	%	n	%	
Bad	9	11,5	69	88,5	78	100	
Good	16	5,2	293	94,8	309	100	0,041*
Total	25	6,5	362	93,5	387	100	

| Mother Behavior | Infant and child mortality under 5 years | | | | Total | | P Value |
| | Yes | | No | | | | |
	n	%	n	%	n	%	
Bad	10	11,9	74	88,1	84	100	
Good	15	5	288	95,0	303	100	0,022*
Total	25	6,5	362	93,5	387	100	

| Economy sources | Infant and child mortality under 5 years | | | | Total | | P Value |
| | Yes | | No | | | | |
	n	%	n	%	n	%	
Bad	0	0	49	100	49	100	
Good	25	7,4	313	92,6	338	100	0,049*
Total	25	6,5	362	93,5	387	100	

Contd…

Environmental conditions	Infant and child mortality under 5 years				Total		P Value
	Yes		No				
	n	%	n	%	n	%	
Bad	10	12,5	70	87,5	80	100	
Good	15	4,9	292	95,1	307	100	0,014*
Total	25	6,5	362	93,5	387	100	

Table 2 shows the Proportion of Maternal Education on infant mortality that is 11.5% infant mortality with poor mother education level whereas there are 5.2% infant mortality with good mother education level. Pursuant to result of statistical test by using Chi Square test obtained value p Value = 0,041 so it can be concluded that there is influence of mother education to infant mortality incidence in Makassar City Year 2017.

Parents' education factors, especially mothers, have an effect on their ability to receive outside information, especially on how to care for good children, how to maintain their children's health, education. Mothers with good education are considered to have knowledge of the right menu selection for their children and in determining the priority scale of spending their money[8].

Based on table 2. Proportion of Mother Behavior to infant mortality is 11,9% infant mortality with bad mother behavior while there is 5% infant mortality with good mother behavior level. Pursuant to result of statistical test by using Chi Square test obtained value p Value = 0,022 so it can be concluded that there is influence of mother behavior to infant mortality event in Makassar Year 2017.

The health behavior of pregnant women has to do with the infant mortality rate, because the greater the level of mother's awareness of health behavior during pregnancy and childbirth, the infant mortality rate is getting smaller[9].

Based on the table 2. The proportion of economic resources to infant mortality is 0% infant mortality with bad economic source whereas there are 7.4% infant mortality with good economic source. Pursuant to result of statistical test by using Chi Square test obtained value p Value = 0,049 so it can be concluded that there is influence of economic source to infant mortality incidence in Makassar.

Working mothers and low incomes will reduce both the nutritional state of balitanya because the working mother will not have much free time to take care of her toddler and the low purchasing power of food due to low income[10].

Maternal economic activities will affect the nutritional status of under-five children who are not good if the mother is low income and if the mother is high income then the nutritional status of children can be good depending on the pattern of maternal food intake to balitanya[11].

Based on table 2. The proportion of environmental conditions for infant mortality is 12.5% infant mortality with poor environmental condition whereas there are 4.9% infant mortality with good environmental condition. Pursuant to result of statistical test by using Chi Square test obtained value p Value = 0,014 so it can be concluded that there is influence of environmental condition to infant mortality incidence in Makassar.

Environmental contamination: air, water, food, fingers, skin, soil, inanimate objects, insect vectors and environmental smokers. The environment is very influential on the spread of a disease that can result in the existence of a toddler mortality[12].

Influence component implementation of maternal and child health program to the survival of under fives in Makassar city

Table 3: Analysis of Influence Resource, Communication Modeling, Bureaucratic Structure on Infant Mortality in Makassar City 2017

Resource	Infant and child mortality under 5 years				Total		P Value
	Yes		No				
	n	%	n	%	n	%	
Bad	9	13,0	60	87,0	65	100	
Good	16	5,0	302	95,0	318	100	0,014*
Total	25	6,5	362	93,5	387	100	

Contd…

Communication	Infant and child mortality under 5 years				Total		P Value
	Yes		No				
	n	%	n	%	n	%	
Bad	13	9,9	118	90,1	131	100	
Good	12	4,7	244	95,3	256	100	0,047*
Total	25	6,5	362	93,5	387	100	

Bureaucratic Structure	Infant and child mortality under 5 years				Total		P Value
	Yes		No				
	n	%	n	%	n	%	
Bad	11	12,5	77	87,5	88	100	
Good	14	4,7	285	95,3	299	100	0,009*
Total	25	6,5	362	93,5	387	100	

Disposition	Infant and child mortality under 5 years				Total		P Value
	Yes		No				
	n	%	n	%	n	%	
Bad	9	12,3	64	87,7	73	100	
Good	16	5,1	298	94,9	314	100	0,024*
Total	25	6,5	362	93,5	387	100	

RESOURCES

Based on the table 3. The proportion of resources to infant mortality is 13.0% infant mortality with bad resources while there is 5.0% infant mortality with good resources. Pursuant to result of statistical test by using Chi Square test obtained p value = 0,014 <0,05 so it can be concluded that there is influence of resources to infant mortality incidence in Makassar Year 2017.

Communication: It found also that on table 3, the proportion of health personnel communication to infant mortality is 9.9% infant mortality with poor communication of health personnel while there is 4.7% infant mortality with good health personnel communication. Based on the results of statistical tests using Chi Square test obtained p value = 0,047 <0,05 so it can be concluded that there is influence of health personnel communication on infant mortality incidence in Makassar Year 2017.

a. Bureaucratic Structure: Based on table 3 Proportion of bureaucratic structure to infant mortality is 12.5% infant mortality with bad bureaucracy structure while there is 4.7% infant mortality with good bureaucracy structure. Based on the results of statistical tests using Chi Square test obtained value p Value = 0.009 <0.05 so it can be concluded that there is influence of bureaucratic structure to the incidence of infant mortality in the city of Makassar.

b. Disposition: Based on the table 3. The proportion of disposition to infant mortality is 12.3% infant mortality with poor disposition while there is 5.1% infant mortality with good disposition. Based on the results of statistical tests using Chi Square test obtained p value = 0,024 <0,05 so it can be concluded that there is influence of disposition on infant mortality incidence in Makassar Year 2017

Table 4: Analysis of the Most Influential Factors on Infant Mortality in Makassar City 2017

Variable	B	Sig.	Exp(B)	95% C.I. for Exp (B)	
				Lower	Upper
Behavior	1.000	.074	2.718	.908	8.140
Resource	1.422	.013	4.144	1.343	12.788
Disease Control	2.705	.000	14.949	4.714	47.403

Contd…

Child Health service	1.687	.003	5.404	1.806	16.167
Environmental conditions	1.192	.038	3.294	1.071	10.129
Wound Infection	2.262	.000	9.604	3.157	29.218
Bureaucratic Structure	1.249	.023	3.486	1.185	10.249
Nutrition Consumption	1.411	.009	4.100	1.429	11.764
Constant	-18.923	.000	.000		

Table 4 describes further variables in multivariate analysis are 7 variables such as behavior, resources, disease control, child health service, environmental condition, infectious wound, bureaucracy structure and nutrient consumption. The most influential variable is controlling the disease with significant value 47.403 and wound infection with the value 29.218.

Value of the two variables above is not stand alone so that the high variable value that causes infant mortality becomes high. Factors that are so influential that causing the two high variables of educational factors and behavior of parents.

Based on the results of research on the proportion of Mother's Education on infant mortality is as much as 11.5% infant mortality with poor education level of mother while there is 5.2% infant mortality toddler with good mother education level. Parents who have a good knowledge in caring for babies in this case is to have a good knowledge about the diseases that often affects infants and toddlers, certainly can prevent and stop the infant and under-five mortality factor.

While the proportion of Mother Behavior on infant mortality is as much as 11,9% infant mortality with bad behavior of mother while there is 5% infant mortality of children under five with good mother behavior level. Bad behavior of parents such as smoking, unhealthy living behavior at home in this case the cleanliness of food and beverages as well as the home and family environment. Infant mortality can be prevented and stopped by improving parental behavior and healthy life[13,14].

CONCLUSION

1. Demographic characteristics that affect infant mortality are education and parental behavior.

2. Components of the implementation of maternal and child health programs on the sustainability of children under five years of age in Makassar that have influence that is communication, bureaucratic structure, and disposition.

3. Hypothesis proved that socio-economic characteristics associated with infant mortality, because the better the quality of socioeconomic in this case is the education and behavior of parents, the infant mortality is getting smaller. And the implementation of maternal and child health programs on the survival of infants has to do with the infant mortality rate, because the better the service then the infant mortality rate is getting smaller.

Conflict Interest: During the study, no problems were found to cause conflict in patients at the time blood sampling and placental tissue.

Ethical Clearance: Taken from Medical Faculty committee of University, Makassar

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The Effect of Occupational Stress, Quality of Worklife and Organizational Climate on Officials' Work Satisfaction of Regional Public Hospital of Undata Palu

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ABSTRACT

Job satisfaction is a result of employees' perception on their performance in carrying out assigments that are considered important. The aims of the research were to analyze the effect of work stress, Quality of worklife and organizational climate either partially or simultaneously on officials' job satisfaction and to analyze work stress, Quality of worklife and organizational climate factors which mostly affected officials' work satisfaction of regional Public Hospital of Undata Palu. This research was a survey analistic study with cross sectional study design. The sample consisted of 247 officials selected using proportional stratified random sampling method. The data were obtained using questionnaire and analyzed using multiple linear regression. The result of the research indicate that work stress variable negatively and significantly affects work satisfaction, Quality of worklife positively and significantly affects work satisfaction and organizational climate positively and significantly affects work satisfaction. Work stress, Quality of worklife, and organizational climate simultaneously have a significant effect on officials' work satisfaction. The most dominant effect of job stress, Quality of worklife, and organizational climate on officials' work satisfaction is respectively job demand, balanced compensation, and recognition.

Keywords: *work stress, Quality of worklife, organizational climate, work satisfaction*

INTRODUCTION

Job satisfaction is pleasurable or positive emotional state resulting from the appraisal of one's job or job experiencesand the environment where one works[1]. Job dissatisfaction will encourage people to behave in a certain way. According to Robbins & Judge[2], job dissatisfaction can be shown through behaviors such as voice response, absenteeism, and quitting the job.

Job satisfaction is affected by both intrinsic and extrinsic factors[3]. Work stress factors may affect overall job satisfaction[4]. Stress at work has become a significant and relevant issue in the modern world. Job stress can impact on the employee's health and well-being, causing emotional and mental problems not only physiologically but also psychologically. Moreover, job stress can negatively affect work efficiency, performance and service quality and lead to increase in turnover rate[5]. Based on a study conducted earlier by Nam et al[6], showed that job stress significantly correlates with job satisfaction where job demands, work performance discrepancies and job insecurity are the most important stressors.

Kermansaravi et al[7] found a relationship between job satisfaction and quality of worklife mainly in compensation and social integration indicators. While Rubel & Kee[8], state that compensation, supervisor behavior, compensation and convenience, work life balance have a significant association with employee job satisfaction. Job satisfaction is build upon salary that theyearned, how far salary meets employee's expectations and how the salary is given. Good quality of worklife will lead to a good relationship atmosphere and high employee motivation and monetary gains still rank first in employee importance[9].

Job satisfaction can also affected by the organizational climate. Rahmawati & Supartha[10] found that organizational climate has positive and significant effect on job satisfaction. It means that means that if the organizational climate is better, it will also increase job satisfaction. Organizational Climate provides conditions that support the effectiveness to achieve organizational goals. High performance will create an individual satisfaction[11]. Based on the above emerging description,

it is important to conduct a research focusing on the effect of work stress, organizational climate and quality of worklife either partially or simultaneously on officials' job satisfaction.

MATERIAL AND METHOD

Location and Research Design: This study used a survey analistic with cross sectional study design. It was conducted at Regional Public Hospital of Undata Palu, Central Sulawesi from March to April 2017.

Population and sample: The population of the study were all Regional Public Hospital of Undata Palu's officials that have been working more than five years and willing to participate in this study. The number of samples consisted of 247 officials selected using proportional stratified random sampling method.

Data Collection Method: Data collection was performed by using questionnaire and interviews. There were severalquestions in the questionnaire prepared for work stress, quality of worklife, organizational climate and job satisfaction. Validity and reliability test have been conducted for this instrument.

Data Analysis: Respondent characteristic data were obtained to know their gender, age, education level, job position, and years of work. Data were analyzed using multiple linear regression to find out the effect of work stress, quality of worklife and organizational climate either partially or simultaneously on job satisfaction among officials at Regional Public Hospital of Undata Palu.

RESULTS

Characteristics of respondents: A total of 247 respondents participated in this survey study. According to the gender, most respondent are female (75,9%) and the average age of the respondents was 32-38 years old (33,6%).

Table 1: Distribution Characteristic of Respondents

Characteristic of Respondents	n	%
Gender		
Male	57	23,1
Female	190	76,9

Contd…

Age (year)		
25-31	79	32,0
32-38	83	33,6
39-45	51	20,6
46-52	22	8,9
≥53	12	4,9
Education Level		
SMP	1	0,4
SMA	16	6,5
D1/D3	122	49,4
S1	95	38,5
S2/S3	13	5,3
Job Position		
Physician	19	7,7
Paramedics	130	52,6
Non Paramedics	42	17,0
Non Medics	56	22,7
Years of Work		
6-11	137	55,5
12-17	67	27,1
18-23	21	8,5
24-29	14	5,7
≥ 30	8	3,2

Most of the respondent completed their diploma which is 122 (49,4%) and total of 130 (52,6%) respondents are paramedics. Majority of respondents have been working for 6-11 years which is 137 (55,5%) respondents.

Univariate Analysis: Table 2 shows that from 247 respondents, majority (57,1%) of the respondent indicates that the work stress is high while (42,9%) of the respondents indicates that their work stress is in low level. Regarding the quality of worklife, about 175 respondents (70,9%) demonstrated low level of *Quality of worklife*and 72 respondent (29,1%) demonstrated high level of quality of worklife. Further, 137 respondents (55,5%) were found to have poor organizational climate and 110 respondent (44,5%) were found it good.

Table 2: Descriptive Statistic on Research Variable

Variabel	n	%
Work Stress		
Low	106	42,9
High	141	57,1

Contd…

Quality of worklife		
Low	175	70,9
High	72	29,1
Iklim Organisasi		
Poor	137	55,5
Good	110	44,5
Job Satisfaction		
Not satisfied	172	69,6
Satisfied	75	31,4

Meanwhile it was found that, 172 respondents (69,6%) stated that they are not satisfied with their work and 75 (31,4%) respondents are satisfied with their work.

Multivariate Analysis: Table 3 shows thatthe t value of work stress = -15,569 less than -t table = -1,960, *Quality of worklife*(t value = 20,112) and organizational climate (t value = 16,393) greater than t tabel = 1,960 meaning that partially work stress, quality of worklife and organizational climate affected job satisfaction. Regression coefficient of work stress is -0.155 with the significant value of i.e. sig 0.000 which shows negative relationship among work stress and job satisfaction. Regression coefficient of *Quality of worklife* ($\beta = 0,158$ and p = 0,000) and organizational climate ($\beta = 0,233$ and p = 0,000) shows positive relationship with job satisfaction.

Table 3: Partial Significance Test Analysis (t Test) and Multiple Linear Regression

Model	Unstandardized Coefficients	t	Sig.
Work Stress	-0,155	-15,569	0,000
Job Demand	-0,168	-3,672	0,000
Role Demand	-,0162	-3,137	0,002
Interpersonal Relationship	-0,136	-1,723	0,086
Organizational Leadership	-0,229	-1,808	0,072

Contd…

Technological Changes	-0,132	-3,623	0,000
Quality of Worklife	0,158	20,112	0,000
Balanced Compensation	0,278	8,693	0,000
Communication	0,017	0,326	0,745
Employees Involvement	0,108	3,033	0,003
Career Development	0,182	4,764	0,000
Facilities	0,101	2,281	0,023
Organizational Climate	0,233	16,393	0,000
Structure	0,159	3,638	0,000
Standard	0,006	0,139	0,890
Responsibilities	0,004	0,086	0,931
Recognition	0,503	12,677	0,000
Support	0,118	2,428	0,016
Commitment	0,185	4,054	0,000

Meanwhile, the strongest factor of work stress, quality of worklife and organizational climate that affect job satisfaction respectively is job demand ($\beta = -0,168$ and p = 0,000), balanced compensation ($\beta = 0,278$ and p = 0,000), and recognition ($\beta = 0,503$ and p = 0,000).

Table 4 illustrates that F = 150.697 with the significant value of i.e. sig 0.000 which is less than 0.05, this argues that the three independent variabels simulteneously and significantly affect job satisfaction.

Table 4: Test Results of ANOVA

Model	F	Sig.
Work Stress, Quality of Worklife, Iklim Organisasi	150,697	0,000

Table 5 shows that the accustomed R2 for work stress is 0,489 meaning that 48% of the variance in job satisfaction can be predicted by work stress.

Table 5: Coefficient of determination

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Work Stress	0,706	0,499	0,489	1,005
Quality Of Worklife	0,806	0,649	0,642	0,841
Organizational Climate	0,815	0,664	0,656	0,824
Work Stress, Quality of Worklife, Organizational Climate	0,806	0,650	0,646	0,836

The accustomed R2 for quality of worklife and organizational climate are 0,642 and 0,656 meaning that 64% of the variance in job satisfaction can be predicted by quality of worlife and 65% of the variance in job satisfaction can be predicted by organizational climate. Simulteneoulsy, work stress, quality of worklife and organizational climate can affect 64,4% of job satisfaction meanwhile the rest 35.6% is caused by other factors that not mentioned in the model.

DISCUSSION

Partial significance test analysis (t test) on work stress variable showed significant negative relationship with job satisfaction. That means that officials who were more satisfied with their work are less stressed.

Antoniou *et al[4]* found that certain factors of stress are capable to affect overall employees job satisfaction in Hospital of Greece. Mansoor *et.,al[12]*, concluded that low job satisfaction was found in those who experienced work stress. A similiar research was conducted by Nam *et al[6]*, to health workers in South Korea showed that work stress and job satisfaction are negatively correlated.

Based on result of coefficient regression test, from five job stress indicators that were used to predict job satisfaction, job demand was the strongest factor that affect official's job satisfaction at Undata Palu Hospital. Trivellas *et al[13]*, found that physical environment and high job demans on nurses can impact the high level of stress and eventually decrease service quality and job satisfaction Mallongi.A[14].

The result of the partial effect of significance (t-test) in the variable Quality of worklife shows there are positive and significant influence between the variables Quality of worklife and job satisfaction. That is, the higher the Quality of worklife, the higher job satisfaction. Research conducted by Rubel & Kee[8], Found that the Quality of worklife has a positive and significant relationship to job satisfaction. Hinami et al[15], States that the factors affecting the quality of working life job satisfaction of hospital workers. The test results of the regression coefficients showed that of the five indicators of Quality of worklife used to predict job satisfaction, obtained indicator of fair compensation as an indicator that most influence on employee satisfaction in hospitals Undata Palu.

Based on the regression coefficient test conducted on six indicators of organizational climate, gained recognition as an indicator of organizational climate that most influence on job satisfaction. The results are consistent with research conducted by Tessema et al[16], Which states that there is influence between recognition and job satisfaction. Recognition is an indication that members of the organization feel valued if they completed the task well through the balance between reward and criticism Wirawan[17], Recognition that the internal factors of the award, was ranked higher requirement Robbins & Judge[2], Based on the theory of Maslow's hierarchy, the lowest level such as salaries and benefits must be met before the higher level needs that can affect the motivation and satisfaction Baskar[17], If we expect a higher level of recognition of employees, first need to meet the needs at the lowest level. One of the effects and reasons for the importance of recognition for employees are those who feel valued will be more positive about themselves and their ability to contribute to and recognition of employees may increase productivity and improve customer satisfaction.

Based on the statistical test ANOVA or F obtained by the stress of work, Quality of worklife and organizational climate is jointly effect on employee satisfaction Undata Palu Hospital. Research results are consistent with the results of research conducted by Mosadeghrad et al[19], Which states that the stress of work and the Quality of worklife influence on job satisfaction, which employees should be considered as an asset of resources continues to grow so that work satisfaction can improve the quality of health services. Permadi and Main[20] states that the organizational climate and Quality of worklife has a positive and significant effect on job satisfaction. Bronkhorst et al[21], concluded that a pleasant organizational climate can significantly affect mental health and reduce the rate of burnout is a symptom of job dissatisfaction in health care workers.

CONCLUSION

Work Stress, quality of worklife and organizational climatepartially affect job satisfaction amongst officials at Regional Public Hospital of Undata Palu. The strongest influencial factor of work stress on officials' job satisfaction is job demand. The strongest influencial factor of quality of worklife on officials' job satisfaction is balanced compensation. The strongest influencial factor of organizational climate on officials' job satisfaction is recognition. Work stress, quality of worklife,and organizational climate simultaneously have a significant effect on officials' job satisfaction.

Ethical Clearance: was taken from the Campus committee and the agreement with the respondents

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Understanding the Perspectives of Village Leaders and Institutions in Transforming Social Conflict into Peace and Health

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ABSTRACT

This research analyzed the dynamics and management of village level conflict and community health status using a qualitative method. Results indicate that conflicts are dynamic and affected significantly by how villagers themselves define the main sources of their conflicts and living healthy. Village leaders and village institutions are both important factors in conflict management. If both operate effectively in resolving village conflicts, a peaceful situation can be created. Where either or both factors do not operate effectively the outcome can be a security crisis even degenerating into communal violence. Therefore, strengthening the capacity of village leaders and village institutions to manage conflict and living healthy is strongly recommended.

Keywords: *Social conflict, conflict management, village leaders, communal violence.*

INTRODUCTION

Conflict may arise from many factors and become manifest in many ways. Many of these studies rest on a similar view that social conflict is a natural phenomenon that need not result in violence. Therefore, it is possible for conflict to be managed carefully and manifest only in non-violent means[1]. Other studies on ethnic conflicts explore the role of civic engagement and how this defines how the conflict manifests[2].

Conflict resolution is a way of ending a disagreement between two or more parties involved in a dispute. This will be achieved more easily when the mediator acts as a facilitator to ensure that all parties to the conflict resolve their differences in a peaceful manner[3], conflicts could arise not only in the workplace, but also anywhere else, like between neighbors, coworkers, colleagues, peers, and even among intercultural family members[4]. One current trend in contemporary studies of conflict management is to seek 'the local turn' in peace building[6,7]. Another study in Somalia recommended the government to carry traditional institutions and clan leaders that are closer to the grassroots and wield a lot influence along with them in its governing efforts state

security structures[8]. In African societies, traditional conflict resolution institutions offer great prospects for long lasting peace in a post-conflict period than the modern law court institutions[9].

The respect of villagers to their leaders offers potential to influence peoples' attitudes and behavior, particularly during conflict resolution process. Several researchers Azebre et.al, Muchie and Bayeh[11,12] have concluded that traditional conflict resolution mechanisms have many advantages compared to modern court system[13]. Another case study conducted by Klašnja and Novta [14] on Hindu–Muslim riots in the 1980s and 1990s in India and the Bosnian Civil War from 1992 to 1995 shows segregation and ethnic polarization as being conditions for social conflict breaking out into violence.

One similar piece of research conducted in Africa recommended that village leaders work in a collaborative approach to gain effectiveness in resolving local conflicts[15]. This research have been explained relationships between village institutions and village leaders that can either be effective or ineffective in transforming social conflict into peace. At the same time communities health status is becoming serious

issue. Therefore, the research analyzes the dynamics and management of village level conflict and community health status.

MATERIAL AND METHOD

This was a qualitative research employing a phenomenological strategy. All data were collected from the village conflict areas in the Region of Luwu in the Province of South Sulawesi, Indonesia. The research compared two groups of villages, the first pair of villages were relatively peaceful areas (*Pa*) while the second pair were riot-prone areas (*Rpa*), due to respectively either the absence (*Pa*) or occurrence (*Rpa*) of communal violence associated with the conflict and the communities health status. 63 persons as informants with some of these participating in focus group discussions. Among them,

there were 20 informants who were engaged intensively as key informants. Most of them were villagers who have been engaged in the social conflict.

RESULTS AND DISCUSSION

According to the cultural pluralism perspective of Furnivall[16], the existence of a degree of differentiation and complementarity between individuals, as seen in more multicultural societies offer a potential that can lead to social conflict.

December 1999 bore witness to a period of heightened social conflict in the Region of Luwu due to communal violence breaking out simultaneously in 5.68% of the villages located within 28.57% of districts within the Region of Luwu, Table 1.

Table 1: The intensity of social conflicts, violence, and health from the Period of 1998-2000

Year	Conflicts Number	Number of districts with conflict experience	Number of village with conflict experience	Victims			Number of buildings damaged or burnt
				Dead	Injured	Save/ Health	
1998	9	4 (19.04%)	16 (3.92%)	31	>100	<90	180
1999	8	6 (28.57%)	23 (5.68%)	>6	≤100	<80	300
2000	3	3 (14.28%)	5 (1.23%)	3	≤100	<80	258

The research identified the following four main findings:

1. Conflict definition essential for conflict severity: The perspective of the *Buginese* is quiet often that land disputes, as settled by local government and the police, are unfair and tend to side with the migrant side since they are able to give extra money for services. As such this phenomena is likely to support some Neo Modernist arguments in the Ethnic Conflict Theory, which posits that a process of modernization that does not provide the same advantages among ethnic groups, will sharpen economic competition and become a source of ethnic conflict [17,18].

Conflict over land ownership is experienced in almost all villages in the Luwu Region. The question that arises is why is communal violence associated with these conflict only experienced by communities in certain villages and not in other villages across Luwu? This research found

that the way parties in the village define the key cause of conflict is essential to determining whether the conflict degenerates into violence or is managed peacefully. If the conflict is defined or perceived in diverse ways among the parties and additionally, where such perceptions contain prejudice against another identity-based group, then most likely the conflict can degenerate into communal violence. Furthermore, if the conflict definition in the village is objective (not based on identity-based prejudice) and perceived along similar lines among the parties, then most likely such a conflict can be managed more easily and resolved peacefully. Most important is to look at issues that tend to lead to the emergence of prejudice and fear. The following cases in two pair of study sites, riot-prone areas (*Rpa*) and peaceful areas (*Pa*), demonstrate these phenomena.

In *Rpa,* the local ethnic and migrant communities defined and attributed the conflict to different issues. To the *Buginese*, the conflict arose due

to economic pressure on them because of the presence of migrant communities that have taken advantage of the local resources. Life is more difficult because they have less rights to cultivate the land because migrant communities have been provided with ownership (for example through state sponsored transmigration programs) of 70% of the agricultural land. The fact has shown that after years of living together, a socio-economic mobility gap between the *Buginese* and the migrants has emerged in which the migrant communities, particularly those who belong to the Toraja and Rongkong ethnic communities have become more successful economically relative to the *Buginese*.

Separately in the relatively peaceful areas *(Pa)*, the two communities in conflict, migrants and *Buginese*, have similar understandings that communal conflict occurs because of the ineffective services offered by the local government in providing land ownership to the people. Thus, both communities define that communal conflict will be resolved if the local government is responsible and fair in fulfilling the land rights of both communities. The importance of framing a\ conflict situation among the parties has positive consequences to peace building. These experiences demonstrate that conflict behavior is the reaction to the perception of a conflict situation[19].

2. **Village leaders need to be present and capable in order to operate as a conflict safety valve agent:** The concept of the safety valve as outlined by Coser refers to an institution that serves as a general means to release aggression and frustration[20]. The following applies the safety valve approach in the context of village communal conflict.

Evidence that supports this finding is described below.

The Region of Luwu, the area where the research sites are located is known as the location for one of Indonesia's great kingdoms in the past. Echoes of the existence of this kingdom until now are maintained through the ongoing recognition of the traditional power of descendants of the king and royal family whom the Luwu community refers to as as *Datu*. The people hold the *Datu* in great respect since

they believe the wisdom of *Datu* could resolve any disputes of the people in fair and just manner, regardless of the ethnic or religious background of those concerned. Lower level positions of *Datu* in the village level are the traditional leaders named among others with various honorary degrees such as *Maddika* and *Makole*.

A different dynamic was revealed in the two Rpa villages. In one place there was an absence of a *Makole* from 1979 when the last *Makole* passed away for almost 20 years until 1998 when a successor was finally recognized. In the other *Rpa* village a *Makole* did exist although the villagers ignored him as they deemed him to have an inappropriate character. At the same time, the two *Kepala desa* (formal village head) were also ineffective because of their conflicts of interest and time given they were also working on their private businesses instead of focusing on their duties as official village heads (*Kepala Desa*). Indeed one of them did not even reside in the village of which they were head but rather in the district capital.

Facing this situation, the village head initiated various intensive activities that brought residents to merge without displaying ethnic origin. For example, in a game of village sports such as football, the membership of the teams would blend players between various ethnic groups, immigrants and the natives. In special events, such as village anniversaries arts, entertainment and traditional music in balance belonging to local ethnic and migrants were presented.

3. **Effective village institutions are useful in conflict management processes:** The research also revealed that the effective functioning of village institutions are able to reinforce a formal village leader's capacity to manage communal conflict. In particular the task of conflict management can be shared with village institutions, which in turn allow the conflicting parties to have more channels to resolve the conflict matters. Experiences in riots prone areas (Rpa) and in relatively peaceful areas (Pa) below explain the dynamic of how village institutions work in relation to the conflict management process. One important village institution is the *Badan Perwakilan Desa* (Village Consultative Institutions), shortened to *BPD*. It is a village level legislative body and part of system

of village governance that is responsible for establishing village policy. The *BPD* also works as a body to voice and promote the aspirations of the village citizenry.

In other areas, notably in the *Pa* villages the *BPD* does assume some functions in the conflict management process. In these villages, members of *BPD* consist of *kepala dusun* (hamlet head) and representatives of all village's identity groups; local ethnic, migrants, women and youth. The *Kepala Desa* (formal village heads) and the *BPD* agreed to develop a strategy to ensure the *BPD* is able to function properly, including by assigning tasks to the *BPDs* in the conflict management process. The *BPD* is responsible for providing advice or assistance in any dispute or social conflict, prior to the (formal village head) having to act. This includes addressing individual or personal disputes submitted to the *BPD and* to the relevant hamlet head. This situation creates an environment for addressing conflicts in a constructive manner. A similar finding, namely that a collaborative mode of work is suitable to a village leader, is also outlined by Desmond[15] based on his study regarding enhanced conflict resolution and peace building in the villages of Zimbabwe.

4. **Communities health consequences and the management:** This study found that similarly, in particular concern, the task of health management can be shared with village institutions, which in turn allow the conflicting parties to have more channels to resolve the health matters together. Conflict both of the past days and present had disrupted the planned some health program such as immunization and vaccines. Unless special strategies and resources are deployed, many other health issues will become threatened to be canceled which may led to a decrease of health status among the communities. Thus, WHO has integrated conflicts in its strategies for public health action in emergencies[21], WHO formulated the concept of Health as a Bridge for Peace, as evidence from Angola, the Balkans and Haiti suggested that health workers are in a unique position to understand the need for and contribute to peace building. This concept is now taken forward by regional programmes in Europe, South Asia and Africa and by a global consultative process on Planning Ahead for the Health Impact of Complex Emergencies[22-24]. From this process WHO can contribute a preliminary set of observations on Conflict and Health. These facts above indicate that conflict resolution is not only dealing with peace, but also affect community health situation.

CONCLUSION

Formal or informal village leaders have a central role as conflict safety valve agents through being able to construct a definition of the social conflict among the parties on a more objective basis. Effective village leaders have to be supported by the effective village institutions that function with a collaborated mode of work, which in turn open opportunities to address conflicts without delay. Strengthening the capacity of village leaders and village institutions to manage and solve social conflicts are strongly recommended. This enables them to be more potentially effective in mediating village social conflict. Rather there is a need for them to have the ability to manage conflict processes in equipped with appropriate skills and tools. At the same time health status is becoming serious issue in the community. These facts above indicate that conflict resolution is not only dealing with peace, but also affect community health situation. This implies that, it is really necessary to have a strong institution management dealing with conflict resolution and health promotion.

Conflict of Interest: Authors declare that there is no any conflict of interest.

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Effect of Vector Control Strategy on Reduction of Dengue Fever Cases on Children of Elementary School

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ABSTRACT

The dengue epidemic is influenced by the environment by the number of puddles and containers containing the puddle of rain water that became the breeding ground for Aedes aegypti mosquitoes. The larval monitoring activity is useful to increase early awareness of the presence of DHF vectors in the school environment. All the components of the school community and activate the school health program with larva examiner students, in an effort to reduce the cycle of dengue transmissible breeding with empowerment done by increasing knowledge and skills of vector control. This research uses quantitative research with prospective study using experimental quasi design with two group pretest and post test design with inferential causal design. The second stage of entomology evaluation. Data collection was performed by larva monitoring at each school for 6 months. The sample of 108 teachers of the school health business coaches were divided into four groups. Data were analyzed by paired t test and Anova. The free number of larvae was obtained after intervention survey results were highest in group I (88,9), HI (96,3) highest group II while CI (43,13) and BI (0,68) on group IV. The results of Anova test there are differences in house index, free number of larvae, index container, and breteau index between the research groups. Increased of larva free number can break the life cycle of mosquitoes so that population density and mosquito regeneration will decrease

Keywords: Dengue, COMBI, Behavior, module

INTRODUCTION

Dengue Hemorrhagic Fever (DHF) is one of the infectious diseases which is still a priority health problem since it often lead to Extraordinary Occurrence and cause death.[1] This disease is caused by dengue virus that is spread by Aedes aegypti mosquito as the main vector. The number of patient and the area of its spreading increasingly along with the increasing of mobility and population density.[2,3] The increasing number of Dengue Hemorrhagic Fever patients is caused by the unevenness of public awareness on the importance of environmental health in general, especially to keep home, school and surrounding areas free from Aedes aegypti mosquito breeding, in addition, people's habits to hold water longer such as in tubs, jars, drums and others are difficult to remove in a short time.[4] The cause of the increasing number of cases and the increasing number of infected areas, among others, due to the increasing number of immigration so that the presence of new settlements, traditional water storage that is still maintained by the community and the behavior of the community against the cleaning of mosquito nests that are still lacking.[5] School-age children are the next generation of the nation that needs supervision and monitoring, especially health issues because health will shape healthy behaviors so that growth and development will greatly affect to create a healthy generation as well. School is a place to learn and play where children spend more time than home.[6,7,8]

MATERIAL AND METHOD

This study used a prospective study with quasi experimental design with two group pretest and post test design. This means that the researcher wants to compare the purpose of pre-training influence and not training, then the researcher explores the knowledge, attitude and action of the School health program implementing teacher. In the second phase, entomology evaluation was performed. Data collection was performed by larva monitoring at each school for 6 months. The sample of a portion of the population is determined by the extent

of the survey results. as many as 108 teachers of School Health Business development which is divided into four groups. Instrument data collection in the form of questionnaire. The data were analyzed by using paired t parametric test using SPSS software.

RESULTS AND DISCUSSION

Knowledge will influence behavior as intermediate impact and health behavior will influence the increase of public health indicator as outcome of health education. Aegypti mosquito control strategy is performed to reduce morbidity and mortality rate by knowing its breeding place and break the chain of transmission or life cycle of Aegypti mosquito through epidemiological observation. This problematic can be eliminated by trying to apply a Combi method approach based on local culture. School-age children are the next generation of the nation that needs supervision and monitoring, especially health issues because health will shape healthy behaviors so that growth and development will greatly affect to create a healthy generation as well. Good environmental management will reduce the density of vector causes of dengue.[9]

1. **Overview of research location:** This study was conducted in 28 districts in Bone District as a potential area for breeding Aedes aegypti mosquitoes. Dengue disease caused by dengue virus with the main vector of Aedes aegepty and Aedes albopictus mosquitoes, is a disease that becomes one of the main handling priorities. Number of Dengeu Fever incidents nationally fluctuates from year to year. This happens because Aedes mosquitoes breed in clear clogs and are not in direct contact with soil. The usual breeding places around the housing are flower vases, pools/bathtubs even in refrigerators' disposal. While outside the home commonly found place Aedes agepty larvae in empty cans, used tires, plastics, used ponds and others.[10]

2. **Knowledge**

Table 1: Change of respondents knowledge score before and after intervention

Knowledge	Pre	Post 1	Post 2
Training + modification module	8.4	12.96***	14.81***
Training + conventional module	8.3	11.93***	14.15***

Contd…

modification module	8.5	10.89***	13.04***
conventional module	8.3	10.67***	12.78***

* p<0,05 ** p<0,01 *** p<0,001

The results of study showed that all respondents had increased knowledge compared to the initial measurement. This suggests that modification module interventions can improve the knowledge of health school implementing teachers, there is a difference in knowledge at the start of measurements with second, and third measurements. Judging from characteristics of respondents, respondents 1 and group 3 with a relative undergraduate education compared to other groups, so that it can have an effect on improving the overall knowledge. In addition, this group has long been exposed to information about the control of Dengue Vectors.

This result is in line with research by saurab.et al[11] stating that one's education plays an important role in increasing the knowledge acceptance and awareness related to behavioral change to improve its health status.

3. **Attitude:** Attitude is a reaction or response that is still closed from someone to a stimulus or object. It can be concluded that the manifestation of the attitude cannot be directly seen, but can only be interpreted first. Attitude is not yet an action or activity, but it is a predisposition to the action of a behavior. Explain that attitude has main components, namely: Belief, ideas and concepts of an object, Emotional life or evaluation of an object, tend to act. The function of attitude is open reaction or activity, but it is predisposing behavior (action) or closed reaction.

Table 2: Change of respondent attitude score before and after intervention

Attitude	Pre	Post 1	Post 2
Training + modification training	42.15	46.63***	49.67***
Training + conventional module	42.93	46.04***	48.33***
Modification module	42.89	45.41***	47.44***
Conventional module	42.63	44.67***	46.59***

* p<0,05 ** p<0,01 *** p<0,001

Table 2 shows that all attitudinal attitudes increased significantly in second measurement (post test II) both in the training group both with modification module and conventional module without training.

Bivariate analysis was done to get the result of the analysis of the influence of each research variable in both groups, the intervention group as the treatment group and the non-intervention group as the control group.

The results showed that there was an influence on the improvement of attitude of the UKS implementing teachers on the eradication of dengue mosquitoes in both the intervention group and the non-intervention group, but the improvement of the attitude of the UKS implementing teachers in the intervention group was higher than in the non-intervention group . The results also showed that after the intervention of training with modification module, there was a significant difference in the improvement of teacher knowledge (p = 0,002). Influence of Intervention of existing guidance module on improving teacher attitude health school implementation eradication of dengue fever is evident.

This shows that training not only improves knowledge, but also makes teachers understandable. Hence, it will give birth to an attitude, attitudes encourage the birth of behavior to take action in eradicating DHF mosquitoes. Action will become an individual habit if done continuously. This is in accordance with the opinion Notoatmodjo[12] which states the third evaluation level is the application, the ability

to use the material that has been studied in real situations or conditions. This study is in line with that delivered by Dwi jata[13], which states that attitudes gained through experience will have a direct impact on subsequent behavior.

4. Practice:

Table 3: Change of respondent's practice score before and after intervention

Practice	Pre	Post 1	Post 2
Training + modification module	5.67	9.78***	10***
Training + conventional module	5.41	8.44***	9.67***
modification module	5.33	7.93***	8.48***
conventional module	5.37	7.56***	8.26***

* p<0,05 ** p<0,01 *** p<0,001

Table 3 shows that all attitudinal attitudes increased significantly in the second measurement (post test II) both in the training group both with modification module and conventional module without training.

Table 4 shows that there is an effect on the improvement of the action of the health school implementing teachers on the eradication of dengue mosquitoes in the treatment group, when compared before the intervention after intervention (p <0.05). The non-intervention group did not experience increased knowledge (p> 0.05), but the increase in knowledge in the intervention group (mean difference = 0.30) compared to the non-intervention group decreased (mean difference = 0.07).

5. Numerical Density Rate

a. House Index and larvae free number

Table 4: Density measurement results based on house index and larva free numbers

Mouth Density	School	positive school larva	HI	Larva Free Number (100-Hi)
Training + modification module	27	3	11,1	88,9
Training + existing guidance module	27	26	96,3	3,7
Modification module	27	15	55,6	44,4
Existing guidance module	27	24	88,9	11,1
P			0,000	0,000

Table 4 shows that the index house number is lowest in training and modification module HI (11.1), so the highest larva free rate is also in larva free number (88.9). the highest index house number in group II was HI (96,3). The result of Anova test showed that there was difference of house index and larva free number between research (p <0,05)

b. Container index

Table 5: Distribution of larva density based on container type

Containers	Groups											
	Training + modification module			Training + existing guidance module			Modification module			Existing guidance module		
	n	+	CI	n	+	CI	n	+	CI	n	+	CI
Bathtub	21	0	0.0	26	12	46.2	23	7	30.4	20	12	60.0
Dispenser	22	0	0.0	24	1	4.2	15	2	13.3	19	5	26.3
Pot	25	0	0.0	15	5	33.3	19	3	15.8	22	12	54.5
Bucket	25	2	8.0	23	9	39.1	19	2	10.5	24	13	54.2
Gutters	14	1	7.1	1	1	100.0	7	0	0.0	4	1	25.0
Barre	14	0	0.0	17	5	29.4	13	0	0.0	9	5	55.6
Drum	8	0	0.0	3	1	33.3	9	1	11.1	14	7	50.0
Tire	13	1	7.7	15	6	40.0	11	3	27.3	9	2	22.2
Cans	17	0	0.0	12	4	33.3	15	7	46.7	17	6	35.3
Trash can	6	0	0.0	6	2	33.3	10	3	30.0	3	2	66.7
Toilet	2	0	0.0	5	2	40.0	6	2	33.3	0	0	0.0
Pool	0	0	0.0	0	0	0.0	3	0	0.0	2	1	50.0
refrigerator	1	1	100.0	0	0	0.0	0	0	0.0	1	1	100.0
Sink	3	0	0.0	1	0	0.0	2	0	0.0	2	0	0.0
Bottle	6	0	0.0	17	8	47.1	7	2	28.6	5	2	40.0

Table 5 shows that the most container types in group I were flowerpot and bucket (25 pieces), group II was bathtub (26), group III was bathtub (23 pieces) and group 4 was bucket (24 pieces). The most positive types of containers in group I and group III were refrigerator gutters (100%), group II was gutter (100%) and group III was used tin (46.7%).

Table 6: Measurement Result of larvae based on index container and breteau index

Ddensity of larvae	Number of container	Container Positive	CI
Training + modification module	177	5	2.8
Training+ Existing guidance module	165	56	33.9
modification module	159	32	20.1

Contd…

Existing guidance module	151	69	45.7
P			0,000
density of larvae	Container Positive		BI
Training + modification module	5		0,05
Training + Existing guidance module	56		0,56
modification module	32		0,32
Existing guidance module	69		0,69
P			0,000

The highest Container value of index in group existing guidance module was 45.7 and the lowest in group Training and modification module was 2.8. The result of Anova test showed that there was difference of index container between research group (p <0,05).

Table also shows that breteau index is lowest in group training and modification module, so the highest number of larvae free also in group I. and highest in group intervention   existing guidance module. The result of Anova test showed that there was difference of breteau index between study group (p <0,05).

The result of the research showed that the house index was the lowest in the group training and modification module intervention (11.1), so the highest larva free rate was also in group I (88.9). the highest index house number in group II was 88.9. The result of Anova test showed that there was difference of house index and larva free number between research group (p <0,05).

The most container types in group I was flowerpot and bucket (25 pieces), in group II was bathtub (26 pieces), group III was bathtub (23 pieces) and group 4 was bucket (24 pieces). The most positive types of containers in group I and group III were refrigerator gutters (100%), group II was gutter (100%) and group III was used tin (46.7%).

The highest Container value of index in group IV was 45.7 and the lowest in group I was 2.8. Anova assay results showed that there was a difference of index container between the study groups (p <0.05).

Breteau index is the lowest number in group I, so the highest number of larvae free also in group I. and highest in group IV. The result of Anova test showed that there was difference of breteau index between study group (p <0,05).

Implementation of all community members of the school and activate the larva examiner health business program student as an effort to reduce the cycle of dengue transmitter reproduction by empowerment which is done by increasing the knowledge and skills of vector control. This is in line with the research conducted by Chanuai Suwamnbamrung,[11] suggests that community and community leaders can lower the entomology vector indicator of Dengue Hemorrhagic Fever that is house index (HI), container index (CI) and breteau index (BI) and build sustainability) program.

The dengue epidemic is influenced by the environment with the number of puddles and containers containing the puddle of rainwater that became the breeding ground for Aedes aegypti mosquitoes.[12-14]

CONCLUSION

There is influence of information delivery with modification module approach to change of knowledge, attitude, and behavior of DHF vector control. The highest effectiveness of knowledge, attitude, and behavior improvement in the group receiving training and modification module compared to training with existing guidance module.

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Online Apparel Retailing: The Mediating Effect of E-Shopping Intention on the Association among Privacy, Website Content and E-Shopping Satisfaction

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ABSTRACT

The purpose of this paper is to understand the efficiency of E-Shopping Intention and its mediating effect on Privacy and Website Content on E-Shopping satisfaction. Consumers Satisfaction is an integral part for online retailers and online manufacturers. The researcher has analyzed the relationship among independent variable called privacy and website content with dependent variable e-shopping satisfaction. The main aims of the article is to find the mediating effect of E-Shopping Intention mediates the relationship between Privacy and E-Shopping satisfaction in an apparel online shopping atmosphere. Thirdly, the article aims to find whether E-Shopping Intention mediates the relationship between Website Content and E-Shopping satisfaction. The writer has used a sample size of 242 respondents from Coimbatore college students and convenient sampling technique was used for the study. The author has used boot strapping technique in AMOS to find the mediating effect of E-Shopping Intention on the relationship between Privacy and E-Shopping satisfaction as well as the relationship between Website Content and E-Shopping satisfaction. The findings show that E-Shopping Intention completely mediates the relationship between Privacy and E-Shopping satisfaction where as E-Shopping Intention partially mediates the relationship between online E-Shopping satisfaction.

Keywords: *Website Content, E-Shopping satisfaction, E-shopping intention, Privacy, apparel, Online*

INTRODUCTION

Consumers are the ruler of the online marketplace and online retailers always begin and ends with consumers in mind. In today's situation consumer fulfillment is essential and the industry growth depends on how fulfilled the consumer becomes. The more consumer satisfaction, the more selling and productivity exist.

When the e-shopping channel start to grown-up and growth dawdling (Ross, 2010), the strength of rivalry for internet dealer will keep on to raise. Such a aggressive surroundings, coupled with the increase in numbers and diversity of e-consumers, has made the issue of perceptive key factors that drive customers to online store progressively more essential. In spite of the increasing curiosity among manufacturer and marketers, tranquil, there is a broad lack of study on, and a want to expand information about the drivers of customer online shopping performance. Competently running online shops that persuade consumers fulfillment is a dangerous factor underlying continued growth, not just for pure online retailers but also for multi-dimensional e-tailors because of the common effects diagonally channels.[1]

Exacting, industry viewer call for enhanced thoughtful of the possessions of E- shopping value features on consumers fulfillment and succeeding behaviors while captivating customer individuality into description In advance full understanding of online shopping quality also enables e-tailers to monitor and improve their store operations to maximize performance. In response, a number of studies have developed scales for measuring online service quality in a variety of industry and product settings[2]. Accordingly, it seems timely to re-examine current e-shopping quality dimensions are (Security/Privacy, Website Content Content content scales in an online retail operation setting. The article first aims to find whether E-Shopping Intention mediates the relationship between Privacy and E-Shopping satisfaction. Thirdly, the article aims to find whether E-Shopping Intention mediates the relationship

between Website Content Content and E-Shopping satisfaction of shopper completion in an in an apparel online purchasing atmosphere apparel e-shopping environment.

BACKGROUND

Security/Privacy: Yoon (2002) found that business deal and transaction security/privacy is the predecessor of e-shopping intention. It is essential to identify mechanism that improve trust among web customers awareness and aim to distinguish how the mechanism affect prospective cconsumers[3] . Need of individual contact, the corporal distance and the ambiguity of the online all create the customers peril and loss awareness [4] .Privacy/Security -minded customers are worried about whether individual information specified to web companies is exploited for other kind of business reasons against their information and will[5].

An unstable growth of online Spam, cheat, deception has fetch about a rising concern between web consumers Consequently, the security of private customer information and transaction safety is the main fear of online customers Demonstrate of customer data on stealthy online and chopping into internet dealers databases are recurrent online phenomenon[6].

Hung studied the forecasters of Taiwanese customer buying intention and buying purpose. The results explained that four dimensions can be classified (information content , safety , design and privacy) of Web site feature drastically and positively influenced professed Web site quality. Accordingly, when e-shopping through online firms enhanced Web site privacy/security, information content and design promotion aspects , customers have positive opinion about the Web site feature. Additionally, product attribute completely influenced professed product quality. In calculation, professed Web site quality did not have a significant impact on e-shopping intention and e-shopping fortitude[7].

When customers determined to purchase products internet sources because of endorsement attraction, they leaned to ignore and privacy/security and transaction security. However, awareness of business to consumers reliable Payment structure were exposed to significantly manipulate the relationship among and e-shopping intention and consumer fashion involvement. The author interpreted that when customers look for more in sequence about one Web site, they enhance their faith in that Web site and consequently would be eagerly to buy products from the Website Content[8].

Web Site Content: Author developed balance items to calculate online customer awareness of Web site service quality .The most significant Web site content element was Web form, pursued by and information content system design. The shoppers awareness of the Web site inclined e-shopping intention softly of the special effects of e-shopping attitude and value. The significant feature in expect e-shopping intention was practical e-shopping affection and realistic value. Hence, the author recommended that customers were agreeable to buy products online if the internet offer the behavior or tackle that help customers competent internet movement. Also, contribution a mischievous and pleasant Web site surroundings for customers to steer force amplify customers e-shopping behavioral intentions. Based on review of literature and individual interviews with customers who newly purchased from internet[9].

Lab analysis in Tairan to look at the psychosomatic behavior of Web navigator who were uncovered to content Web sites. The non- probability samples was collected of 182 young undergraduate students from four universities in the south of Tairan. The young undergraduate students were requested to visit two e-news sites and reply answer questions about them. The result illustrated that three of the antecedent of attitude toward the Web site (organization , pursuit, information) radically influenced UG students Web site attitude, while brightness did not. Moreover, UG students approach toward the Web site significantly prejudiced their Web site practices and trustworthiness toward the Web site content[10].

E-Shopping Intention: Thou (2004) utilized (LISREL) to observed the relationship among e-shopping intention and its forecasters. After analysis the sample, the entire number of utilizable cases was 427, which produced the useable answer rate of 82.24%. The standard for choosing applicants was that the participants be Taiwanese and have prior knowledge in buying products through internet[11].

A past studies have originate that customers positive online shopping attitudes and e-shopping intention significantly improved their eagerness to shop online. Author examined that the more positive e-shopping

attitude a customer had, the more e-shopping intention that consumer had for attaire shopping[12]. Author established a positive fundamental relationship among attitude toward clothing shopping on the Internet and web consumption. And initiated that e-shopping intention was optimistically and significantly influenced by customers e-shopping attitude. Author created that consumer e-shopping attitude had an indirect impact on internet consumer buying intention[13]

There is a positive relationship between consumer attitude and purchase e-shopping intention toward traditional business conducted a analysis in Iran and recommended that one of the variable that prejudiced(influenced) consumer e-shopping intention was feelings toward internet. Attitudes toward online were classified into four types : ease of use, risk ,relative compatibility, delight. Author examined that awareness of internet service quality was unruffled of four mechanism of Web sites: interactivity, expediency, Web site design and merchandise information[15].

E-Shopping Satisfaction: Author conducted an tentative study to examined the relationship among Web attributes and consumer E- Shopping Satisfaction in the context of web safety brokerage services. They exposed 15 service quality types based on their analysis of 829 customers evaluation and established that seven factors were repeatedly 3 mentions in the assessment: service reliability, system reliability ease of use ,security/ privacy, responsiveness, timeliness, competence access . He examined a study in Iran to examine customers shopping behaviors and e- Shopping Satisfaction . The findings explained that a positive relationship among e-shopping attitude and intention to shop online. He found that feelings toward e-shopping from a respondents of undergraduates in the Iran was directly correlated to e-shopping satisfaction[16].

Objectives of the study

1. To analyze the mediating effect of E-Shopping Intention between Privacy and E-Shopping Satisfaction.

2. To analyze the mediating effect of e-shopping Intention between Web Site and E-Shopping Satisfaction.

RESEARCH METHODOLOGY

Research Design: The samples used for the article were College Students from Coimbatore City. The data was composed from College Students using the questionnaire method. Questionnaires with 27 questions including the demographic variables were circulated for data collection. A total of 242 College Students were targeted but 181 questionnaires were found to be appropriated for the study. The questionnaires consisted of constraint based of 5-point likert scale . Non-probability sampling technique to gather the data from the respondents.

Data Analysis and Interpretation: Structural Equation Modeling(SEM) was made via AMOS software to get the mediating effect of e-shopping intention on the relationship among privacy/security, Web site content and e-shopping satisfaction. Regression to analysis whether the independent variables denotes the dependent variables. Regression analysis was wormed to identify whether the forecaster variables (privacy/security, Web site) have an effect on e-shopping satisfaction. Analysis was done using Structural Equation Modeling in AMOS software. The boot strapping method with SEM is used to find the direct and indirect effect of the mediation variable (e-shopping intention) on the relationship among privacy/security and e-shopping satisfaction as well as Website Content and e-shopping satisfaction.

To test the result, assumption is drawn (figure 1) between privacy and e-shopping satisfaction, Website Content and e-shopping satisfaction, e-shopping intention as the mediating variable between privacy and Website Content, e-shopping intention as the mediating variable between Website Content and e-shopping satisfaction.

Model of SEM: Path Model for one Dependent variable, two Independent variables and one Mediating Variable.
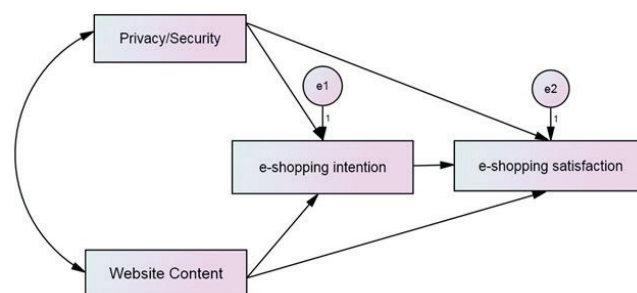

Figure 1: Path Model

The above figure 1 shows the path replica presentation the exogenous variables and the endogenous variables. In the above figure the exogenous variables are Privacy/Security and Website Content wherever the endogenous variable is e-shopping satisfaction. The paths found the implication and launch the interference. The mediation variable is Privacy/Security and signify the hypothesis that e-shopping intention signify the mediation between privacy and e-shopping satisfaction with the mediation among Website Content and profitability.

Table 1: Direct Effects - Two Tailed Significance

	Privacy	Website Content
e-shopping satisfaction	.003	.002

From Table 4 it is inference that the path among privacy and e-shopping satisfaction and the path among Website Content contents and e-shopping satisfaction is considerable since the p value is less than 0.05 which is below the porch value. Arrange to find the mediating result, there must be a direct effect that can be intercede and therefore the direct effect wants to be significant so with the aim of the mediating effect is initiate. Accept alternative hypothesis

Table 2: Indirect Effects - Two Tailed Significance

	Privacy	Website Content	e-shopping Intention
e-shopping Intention	...	...	...
e-shopping satisfaction	.002	.001	...

The above table elucidates the indirect effect of the intervention from privacy to e-shopping satisfaction through e-shopping Intention and e-shopping satisfaction to Website Content through e-shopping Intention. Since the p value is less than 0.05. it is implicit that there is several kind of mediation accessible and the after that to get whether the mediation is having a absolute mediation or limited mediation.

Table 3: Direct Effects-Two Tailed Significance

	Privacy	e-shopping satisfaction	e-shopping Intention
e-shopping Intention	.001	.002	...
e-shopping satisfaction	.035	.883	.002

The above table exemplify the direct effects following with the mediating patchy. The study shows that the path among privacy to e-shopping satisfaction through e-shopping Intention is important since the p value is less than 0.05 hence it is implicit that e-shopping Intention has a partial mediation among privacy and e-shopping satisfaction.

Table 4: Mediating Effects

Hypothesis	Outcome
privacy → e-shopping Intention → e-shopping satisfaction	Full Mediation
Website Content → e-shopping Intention → e-shopping satisfaction	Partial Mediation

The above table prove that e-shopping Intention partially mediates the relationship among privacy and e-shopping satisfaction where as e-shopping Intention entirely mediates the relationship among Website Content and e-shopping satisfaction. As a result the alternating hypothesis H1 and H2 are accepted.

Findings of the Study: The study originate that relationship among privacy and e-shopping satisfaction as well as Website Content and e-shopping satisfaction. The study showed that privacy and Website Content were excellent interpreters of e-shopping satisfaction.

The study primarily aimed to get whether there is a straight effect of privacy and e-shopping intention on e-shopping satisfaction and whether at this point mediating effect of e-shopping intention among the association of privacy and e-shopping satisfaction as well as the association between Website Content and e-shopping satisfaction. The outcome shows that there is really a direct effect of privacy and Website Content on e-shopping satisfaction. The outcome also explain the significance of e-shopping intention as a mediating variable in the association between privacy and e-shopping satisfaction and e-shopping intention as a mediating variable between customer satisfaction and e-shopping satisfaction. The studies proves that e-shopping intention fully mediates the connection among privacy and e-shopping satisfaction where as e-shopping intention partially mediates the association among Website Content and e-shopping satisfaction.

Implications of the Study: The results provide practical information for e-retailers, manufacturers to improve

recognize the web customers answers progression and decide successful electronic store administration tactic that replicate the reverse consumer assessment progression by the empirical shopping intention. First, online dealers advertising clothing merchandise can endorse consumer e-shopping satisfaction and intention to shop at their electronics store by running their service quality finishing in provisos of experiential quality customer service, functionality. This is also important for multi-channel trader In addition, future research in require is to observe the impact of further online shopping motivation dimensions (e.g. communal shopping motive) on online buying behavior and future research to observe the e-shopping qualities dimensions like atmospheric and customer service area of online apparel retailing.

Ethical Clearance: NA

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Analysis of Knowledge and Perception of Implementation of Informed Consent in Patient Pre Operations in HVA Toeloengredjo Pare Hospital

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ABSTRACT

Incompleteness and inaccuracy of charging *informed consent* in patient's pre-operation is a problem related to patient safety, professionalism, behavior, and quality culture. The research objective is to analyze the knowledge and perception of the Implementation of *Informed Consent* in Patients with Pre-Operations at RS HVA Toeloengredjo Pare.

Design *Cross-sectional* study *using*. The population is the preoperative patient at RS HVA Toeloengredjo Pare. Eexclusion criteria using *simple random sampling technique*. The independent variable of research is the knowledge and perception of the patient, and the dependent variable of the study is the completeness and the accuracy of implementation preoperative patient's *informed consent*. Data were collected by questionnaire and a check list, then the data were analyzed using *logistic regression* with *a <0.05* and cross tabulation analysis.

The results showed most respondents have sufficient knowledge of as many as 69 respondents (44,8%), most respondents have the perception that quite as much as 82 respondents (53.2%), regression Logistic showed that the variables significantly affect the perception of completeness *informed consent* (p = 0.000) and in the knowledge variables significantly affect the accuracy of *informed consent* (p = 0.006).

The conclusion of this research is knowledge and perception influence together to the completeness or accuracy of *Informed Consent*. Good knowledge and perception will support the application of *informed consent* accuracy and precision of *informed consent* delivery.

Keywords: Informed Consent, Pre-Operation, Knowledge, Perception

INTRODUCTION

Pre-operation begins when the decision for surgery was made and ends when the patient was transferred to the operating table. Pre-surgery there is some preparation to be prepared by the patient prior to surgery [1]. Officers in explain procedures and patient readiness in carrying out various operations should be assessed properly. Patients and families who have not received a full explanation will have an impact on a variety of factors that could harm the patient or attendant. The problem can be overcome by giving *informed*consent, namely the delivery of information containing elements: diagnosis, action will be planned, alternative procedures, the risks that arise when not carried out such an action, the patient's ability to make decisions, volunteerism of patients who gave consent[2].

Informed consent is a unilateral statement of a legitimate patient or represent that the contents of the approval of the action plan medical or dental filed by a doctor or dentist [3]. Officers in charge completeness of *informed consent* in patients pre-operation are still many incomplete. Research in Switzerland in 2011 found that 45% would prefer to receive *informed consent* through an explanation of the writing, and 80% of patients preoperativedoes not want *informed consent* to read it [4,5]. The results of the study in 2014 at the General Hospital of Karanganyar are Teak Husada 50 surgery on form *Informed Consent* not yet appear what information will be explained to the patient, not the full completenessform *informed consent* at charging No.KTP/SIM (100%) and the type of information presented by the highest doctor medical action (100%) [4]. The results showed

authentication incomplete amounted to 38.10% [6]. The results showed the incompleteness *informed consent* reached 30-70% [7].

Results of a preliminary study on the evaluation of charging *informed consent* in January 2017 in RS. HVA Toeloengredjo Pare of 1608 *informed consent* obtained as much as 3% approver name is notfilled, 3.5% signature approver is not filled, 55% of families witness name is not filled, 42.8% signature witness family name not be filled, 45, 8% name is not filled witness officers, 22.8% signature of witness officer name was not filled, 71.1% DPJP name (Doctor patient Responsibility) is not filled, 18.4% DPJP signature is not filled and there are a total of 33.9% *informed consent is* not filled out completely. Incompleteness *informed consent* in patient's pre-surgery at the RS. HVA Toeloengredjo Pare in January 2017 by 13%.

Factors that lead to compliance with the implementation of *informed consent* in the completeness and accuracy of charging *informed consent* comes from organizational factors, namely the implementation ofsystem *reward* and *punishment* that has not been balanced [5,7-9]. The solution may be in the form of policy, change the format of *informed* preoperative *consent,* or even the standard procedure in *informed consent charging.* Application of a good policy to be followed by the completeness of the info informed *consent* is complete and well too[11]. Based on the results of this study and the background, researchers has studied perception and knowledge Analysis on the Implementation of *Informed Consent* in Patients with Pre Operations at RS HVA Toeloengredjo Pare.

MATERIAL AND METHOD

This study use *Cross sectional* design, population is the preoperative patient at RS HVA Toeloengredjo Pare. Exclusion criteria using *simple random sampling technique.* The independent variable of research is the knowledge and perception of the patient, and the dependent variable of the study is the completeness and accuracy of implementation preoperative patient's *informed consent.* Data were collected by questionnaire and a check list, then the data were analyzed using *linear regression* with *a <0.05* and cross tabulation analysis.

RESULTS

Table 1: Frequency Distribution of Knowledge in patients with pre-Operations at RS HVA on 12 October-11 November 2017 (n = 154)

No.	Knowledge	Frequency	Percentage
1.	Less	26	16.9
2.	Enough	69	44.8
3.	Good	59	38, 3
	Total	154	100

Based on table 1 note that of the 154 respondents, most respondents have sufficient knowledge with 69 respondents (44.8%).

Table 2: Frequency Distribution of perception in patients with pre-Operations at RS HVA on 12 October-11 November 2017 (n = 154)

No.	Perception	Frequency	Percentage
1.	Less than	29	18.8
2.	Enough	82	53.2
3.	Good	43	27.9
	Total	154	100

Based on table 2 note that of the 154 respondents, showed that most respondents have the perception that of 82 respondents (53.2%).

Table 3: Distribution Frequency Completeness Informed Consent in patients with pre-Operations at RS HVA on 12 October-11 November 2017 (n = 154)

No.	Fittings	Frequency	Percentage
1.	Complete	133	86.4
2.	Not complete	21	13.6
	Total	154	100

Based on table 3 note that of the 154 respondents, showed that most *informed consent* respondents were complete with 133 respondents (86.4%).

Table 4: Distribution Frequency Accuracy of *Informed Consent* in patients with pre-Operations at RS HVA on 12 October-11 November 2017 (n = 154)

No.	Accuracy	Frequency	Percentage
1.	Accuracy	137	89
2.	Not Accuracy	17	11
	Total	154	100

Based on table 4 known that from 154 respondents, showed that most *informed consent* respondents are 137 respondents (89%).

Table 5: Logistic Regression Test Variables Between Knowledge and Perception With Completed Informed Consent in patients pre Operations at RS HVA on 12 October-11 November 2017 (n = 154)

		B	SE	Wald	df	Sig.	Exp (B)
Step 0	Constant		-1.846,235	61.792	1,		000,158

The statistical test on this new study used regression, *logistic*s the test results listed in the table above. Statistical analysis showed that the *variables in the equation* obtained the value of *the slope* or *coefficients Beta* (B) of the constants (Exp (B) of 0.158, the significant value of *p value* of wald test of 0.000, which means that each variable give partial effect. Value B is identical to the beta coefficient on *ordinary least squares* (OLS) with Exp (-1.1846) = 0.158, which means that the independent variable has an influence 0.158 times the dependent variable. Statistical test results obtained total df is 2 (two), which tells us the number of variables independent 2 (two).

Table 6: Logistic Regression Test Variables Between Knowledge and Perceptions of the Appropriateness of informed consent in patients with pre Operations at RS HVA on 12 October-11 November 2017 (n = 154)

		B	SE	Wald	Df	Sig.	Exp (B)
Step 0	Constant		-2.087,257	65.856	1,		000,124

The statistical test on this new study used regression, *logistic*s the test results listed in the table above. Statistical analysis showed that the *variables in the equation* obtained the value of *the slope* or *coefficients Beta* (B) of the constants (Exp(B) of 0.124, the significant value of *p value* of wald test of 0.000, which means that each variable give partial effect. Value B is identical to the beta coefficient on *ordinary least squares* (OLS) with Exp (-2.087) = 0.124, which means that the independent variable has an influence 0.127 times the dependent variable. Statistical test results obtained total df is 2 (two), which means the number of independent variables exist 2 (two).

DISCUSSION

Based on the results showed that that the *variables in the equation* values obtained *slope* or *coefficient Beta* (B) of the constants (Exp (B) of 0.158, the significant value *p value* of wald test of 0.000, which means that each variable give partial effect. Value B is identical to the beta coefficient on *ordinary least squares* (OLS) with Exp (-1.1846) = 0.158, which means that the independent variable has an influence 0.158 times the dependent variable. Statistical test results obtained total df is 2 (two) which tells us the number of independent variables there are 2 (two). And found that p <a with a value ≤ 0.05,

as seen in the *Overall Statistics* with significance value of (p) 0.000, which means that there are variables that affect the completeness IC good knowledge and perception of respondents. When viewed value (p) for each independent variable that is variable knowledge (p) of 0.005 and a variable perception of respondents about IC (p) was 0,000

The medical record is a file that contains records and documents of identity, history taking, diagnosis treatment, examination, treatment, action, and other services provided to patients in health care facilities include patient registration that starts from a place of admission.[12]

Informed consent is an approach to the truth and patient involvement in decisions their treatment. Often the best approach to obtain *informed consent* is that doctors will propose or perform procedures to give a detailed explanation in addition to asking patients to read the form[13]. Medical Record is the who, what, where, and how to care for a patient in the hospital, to complement the medical record must have enough data is written in a series of activities in order to produce a diagnosis, assurance, treatment, and outcomes. The medical record is a testimony both written and recorded on the patient's identity, anamneses determination of the physical laboratory, diagnosis of all services and medical action that is given to the patient and the treatment of both the inpatient, outpatient and getting emergency services [14-17]

Perception and a good knowledge directly proportional to the completeness of *informed* pre Operationsconsent. It is an interpretation that perception and knowledge about *informed consent is* obtained capable of affecting the completeness *of informed*consent to do the clerk this can be influenced by the stimulus or process that occurs when the giver of the current explanation given *informed*consent,in accordance with the disclosed[18] which suggests that the perception is the brain's ability to translate the stimulus or process for translating stimulus into the human sensory organs. Researchers found IC completeness variables that affect both knowledge and perception of respondents, is the picture of the implementation of the management condition in hospital, so that management needs to continue improving the quality of service and charging IC in hospitals, especially in patients with pre-surgery. This will increase customer confidence in the use of hospital services in particular-surgery patients.

Based on the results of the study showed that the *variables in the equation* obtained the value of *the slope* or *coefficients Beta* (B) of the constants (Exp (B) of 0.124, the significant value of *p value* of wald test of 0.000, which means that each variable give partial effect. Value B is identical to the beta coefficient on *ordinary least squares* (OLS) with Exp (-2.087) = 0.124, which means that the independent variable has an influence 0.127 times the dependent variable. Statistical test results obtained total df is 2 (two), which means the number of independent variables exist 2 (two). Statistical test results showed that p≤a with a value ≤ 0.05, as seen in the *Overall statistics* with significance value of (p) 0,050, which means that there are variables that affect the accuracy of IC both knowledge and perception of respondents, when seen the value of (p) for each independent variable that is variable knowledge (p) of 0.006 and a variable perception of respondents about IC (p) 0,01[6].

Based on the research that all independent variables affect the dependent variable .. The results showed that the *informed consent* incomplete and imprecise as much as 6.9%. Information *informed consent* givento patients is very important preoperative information is data that has been processed into a form that is meaningful to the recipient and useful in making decisions. Relations with the communication, information is one element of communication is the process of delivering information on the "communicator" to "communicant" [23]. Ease of obtaining information will accelerate a person to acquire new knowledge [24].

Research has been conducted by Sirani found that the incompleteness figure reached 70% which is not exhaustive and is only 30% complete. Appropriateness of *informed consent* is determined by the timeliness of the provision, the competent authorities deliver, and the accuracy of the information on the type ofsheet. *informed consent*Approval granted by competent individuals. In terms of age, a person is considered competent when aged 18 years or older or have never been married. While children aged 16 years or older but not yet 18 years of age can make certain medical consent that are not at high risk if they can demonstrate competence in making decisions. A good knowledge of the *informed consent* then the person will be more responsive and simulating a person to want to get the fullest information before surgery. A good knowledge affects the accuracy of giving *informed consent* for influencing attitudes in accordance with knowledge. A national standard formulation, education is a conscious effort to prepare students through guidance, instruction, and / or training for its role in the future. A good knowledge will cause accuracy in giving *informed* consent[19-21].

CONCLUSION

The researchers found the variables that affect the accuracy of IC both knowledge and perception of respondents. Knowledge and perception variables jointly affect the accuracy *of informed*consent.But if you look one by one variable obtained that knowledge variable affecting the completeness variable IC. Information is a collection of data that is formed to provide the knowledge or can change the perception. With that knowledge and correct information about the health of the IC can support the accuracy of the IC administration. The accuracy of the IC Award in the form of punctuality given and the person who gives the IC. Is the risk that the information given is wrong, and officers who provide pre-IC operation is not medical personnel who will carry out an act of surgery.

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Study on Factors Affecting the Physical and Mental Health by Stress and Emotional Crisis of Working Women

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ABSTRACT

In our present swift life the times are changing. In day to day activities women are contributing their life equally like men for the society. In any industries we use to observe that women are also playing a key role from the management level to the worker level starting from security, house-keeping to chief executive officer and managing director of an organization. When compared with men, women are facing lots of challenges and they have to handle multiple things unlike men. They take equal responsibilities at home as well at office and they have to balance both. When they are concentrating on both they use to get physical and mental strain and fatigue which causes to ill health. When it comes to physical strain then they can manage very well. But when it comes to emotional or mental strain they will be fed-up and needs some support from others. The objective of this research is to study the stress and emotional crisis of working women and necessary suggestions to control their physical health.

Keywords: *Working Women, Health Issues, Family Issues, Psychological Issues, Sustaining Job*

INTRODUCTION

In earlier research many of studies are indicated that women go through rough patch when they are not honoured properly from the work front and also on the personal front. They do not mind to work hard or harder or hardest [1-3]. But when the recognition is not given, they get emotionally down and hence, they need support, respect and recognition to continue their job without fatigue and physical stress. If these three are given to them, they would love working and prove themselves time and again. Stress is a very strong factor for them and it helps them to become a super performer or it makes them a failure. The persistence what women shows is predominantly very high [4-6]. According to 'Women of Tomorrow' survey out of 21 nations and 6500 women, India is leading nation when it comes to stress for women. About 87% of women were stressed most of their time and 82% claimed that they did not find time to relax. The reason behind it is that Indian women have to play different roles in day to day life at work place and home related activities [7-9]. Career opportunities for Indian women are increasing but social norms and family expectations are the root cause of this stress. Out-dated family structures have an uneven effect on the lives of Indian women. This also includes women from urban areas who are highly educated and probably the first one in their family to go for professional career [10-12]. In this research, the three major problems facing by women are health issues, family related and psychological problems were discussed and necessary suggestions were given to minimize their mental tension and fatigue.

HEALTH PROBLEMS

World Health organization states that, woman multiple roles affect not only her own health and well-being but affect the overall health and well-being of the family [13-15]. The heavy stress and strain they face while combining the outside work and domestic work, child care, care for elderly persons make her more tiresome and shegain less leisure. Working woman's total hours of work increases at the expense of her leisure time. The results of health related issues of women employees with different age groups are given in Table 1.

Table 1: Health Related Problems of Women Employees

HEALTH ISSUES (%)	Age: 21-30		Age: 31-40		Age: 41-50	
	Yes	No	Yes	No	Yes	No
Head Ache	85	15	80	20	90	10
Body Pain	65	35	85	15	85	15
Irregular Cycle	70	30	90	10	15	85
Muscle Pull	45	65	95	5	75	25
Back Pain	80	20	100	0	80	20

FAMILY RELATED PROBLEMS

In every family mother's role is so significant and Engle pointed out that mothers can more efficiently allocate resources to childrenthan the fathers, because they are more attached to their children. Disintegration of joint families and development of nuclear families often put heavy stress on the time allocation of working women [16]. Working women with preschool children often pose a heavy strain on their time allocation and to solve this problem is to give more attention to parents and grandparents and thus it will lead to a shift in favour of joint families [17]. Such a change in the outlook of the society will surely reduce the inmates in the old age home and they will enjoy the care and love of their children and grand-children. The Table 2 clearly indicates the family issues of working females in different age groups with percentage of support by their husband, children, in-laws and parents. It was observed that most of the women were expecting for the support from the husband who are in the age of 21-30. Out of 35%, there were 20% who were unmarried, weren't having much issue as they weren't having big commitments. 15% of women said, they do not face much problems as they are supporting them in the work and thus they are in a position to manage. But when it comes to women at the age of 31-40, 30% of women are having support from their husband but the remaining are not having it and they are facing issues in balancing the work, family, husband and children. And finally when it comes to the age of 41-50, they have responded that 75% of women are having support from their husband and 25% feel they are becoming even more troublesome. When it comes to children, every mother wanted to do justice for the role they wish and would like to give 100%. But women who

have children, feels good of being a mother but at the same time taking care of them in their health, studies etc, they get extremely exhausted. If they take the help of parents or in-laws, they feel certain amount of relaxation. But if they leave their small kids in the day care or child care centres, they do not get 100% satisfaction.

Table 2: Family Related Problems of Women Employees

SUPPORT (%)	Age: 21-30		Age: 31-40		Age: 41-50	
	Yes	No	Yes	No	Yes	No
Husband	65	35	30	70	75	25
Children	35	65	40	60	50	50
In-laws	20	80	30	70	15	85
Parents	80	20	45	55	10	90

The survey was conducted with women who are working in the different fields and different industries, who quit the job before and after marriage [18-20]. And also in survey it was noted that how many women quit and continue the job before, during and after child birth. The survey results are given in Table 3 which shows a good result and how family helps them in the support of their carrier being built. Many IT industry women employees who quit their job are not in a position to balance work and home. In the above survey, there are only two industries where women join post-delivery or marriages are banking and educational institutions [21-23]. Many women don't want to quit their high paying jobs, but due to preference for the child, they do compromise. Few take a call on that and they continue to work to support the family financially and also to be financially independent[24-26].

Table 3: Results of Quit and Continue the Job of Women

SECTORS	Leaving Job before marriage (%)	Leaving Job after marriage (%)	Leaving Job after Child Birth (%)	Continuing Job after Child Birth (%)
IT	30	20	50	0
ITES	15	35	40	10
Banking	15	20	45	20
Manufacturing	20	50	25	5
Automobile	10	45	45	10
Healthcare	20	40	25	15
Hospitality	25	35	30	10
Teaching	15	10	10	65

PSYCHOLOGICAL PROBLEMS

Good mental health is essential for the well being of individuals, their families and the community and also mental, physical and social health is interdependent. The different psychological problems with the percentage of crisis of working employees are shown in Figure 1.
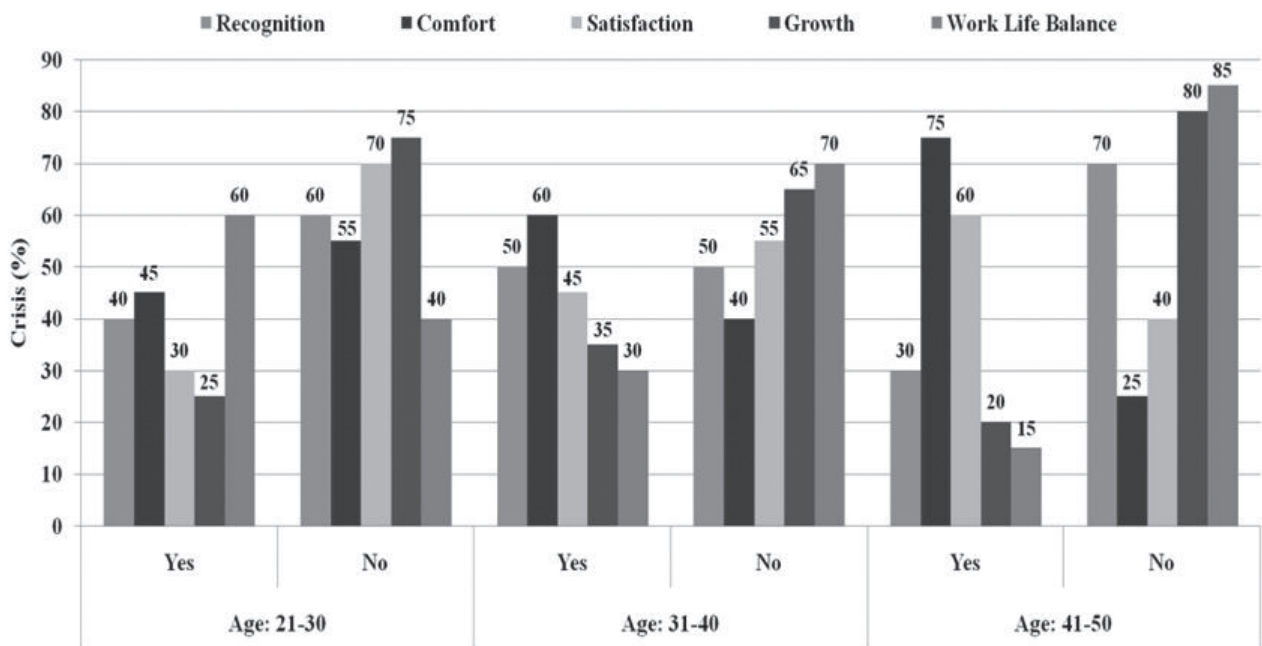
Figure 1: Psychological Problem of Women Employees

The result clearly indicates that every woman needs some amount of emotional comfort which will help them to move on. For working professional, they take up all the roles in the management like boss, executive, manager, security, staff, house-keeping, front-desk etc. All expect from men is recognition and respect and also they do not mind doing more work. But all they expect is taking them into consideration and when it comes to recognition women at the age of 41-50 are missing it badly. For the women who are ranging from 31-40, they are fairly fine with recognition. Few women take up the responsibilities but many don't as they cannot leave the family especially their children. Few take up the call consulting with their family and do. They also have a fairly decent comfort but they lack in the satisfaction. Women who are ranging at the age of 21-30 are slightly dwelling in a profitable position. Since they are in the early thirties, they expect more recognition and comfort from the organization. Woman, who are ranging from 21-25, were unmarried and were ready to take up any

challenges which were pertaining to the work, they were very happy to take things forward. But woman who are ranging from 25-30 were the one to compromise as they would be newly married or attaining motherhood or become a mother.

From the interview results, majority working women point out that they skip their breakfast. One sad reality found in the interview is that now too working woman face lack of family support as one main problem in participating income earning activities outside and this problem is mostly felt by those working women belongs to agriculture related activities, elementary occupations etc. The results of working women needs to follow the work life balance traits to get free from mental stress are given in Table 4 which represents the essentials a women needs to consider. Not everything but the basic seven traits are taken into consideration. The survey was taken in one of the best information technology (IT) company where nearly 150 women employees were taken into the survey. Initially they were hesitant but then they opened up. The survey was taken starting from the entry level management to the senior level management, though the levels change, the crisis is the same. In IT companies, the women are paid well and have a better stake in the organization [27], [28]. When they are in a position to handle more responsibilities at office and home, still they fail to care their health issues.

Table4: Responses from Working Women Needs to Follow for Free from Mental Stress

Code	Work Life Balance Traits	Yes (%)	No (%)
A	6-8 Hours of Sleep	23	77
B	2 Hours for Self - Hobbies, Exercises	10	90
C	Having Food at Right Time	15	85
D	Pampering Self	21	79
E	Vacation once a Year	13	87
F	Taking Breaks for Entertainment	07	93
G	Sharing Responsibilities	09	91

The survey response result indicates that women are not so happy with the way things are going on. Still, if we see most of the women undergo the same level of issues when it comes to balancing the work life and personal life. They are expected to do more at office and also at home. Many of them are burst out due to the work pressure at home as well as in office and it goes above the break-even point.

SUGGESTIONS

Based on the survey results the following suggestions were made to the women employees.

● Ideally spend some quality time for self, thus it gives them some positive energy.

● Share some responsibilities with husband and also to children to get little free from physical tension, if they are in the process of growing up.

● Having minimum 6-7 hours of sleep daily.

● Having helpers at home for cleaning and cooking thus it saves some quality time.

● Preferring joint family system which will help in many ways, but that needs lots of adjustments.

● Taking small breaks whenever possible.

● Having a proper planning and prioritization of tasks are also equally important.

CONCLUSION

From the study and analysis the following conclusions were made. Every woman goes through the different phases to overcome their fatigue life.

● It is common for all the industries, departments and also sectors. Women may have to take the proactive steps and make things work.

● The stress will lead them to multiple issues which will take them for a toss. Work is important and family is equally important.

● More than that 'Caring Self' is even more important. By compromising on that achieving will not be possible.

● In the organization front branding and projecting is very important and it will help in avoiding more stress for working women.

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Child Contact Screening and Chemoprophylaxis against Tuberculosis in South Indian Districts-Situation Analysis

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ABSTRACT

Background: India is a home for one fourth of tuberculosis cases globally. Children living with these cases are always at risk. They should be promptly screened and treated

Aims and Objective: To assess the extent of child contact screening and Isoniazid Preventive Therapy and determine the factors affecting it.

Materials and Methods: This was a cross sectional study. Done by house to house visits, patients or head of the family were interviewed after taking informed consent. Number of children <6 yrs in the households, the extent of screening and isoniazid preventive therapy and various factors affecting it were studied.

Results: Totally 110 eligible Contacts of <6years were identified by household visits, 95(86.36%) of contacts were screened for tuberculosis, 71(64.54%) were initiated with isoniazid preventive therapy in which 53(48.18%) of the contacts had incomplete therapy and only 18(16.36%) completed the IPT therapy.

Conclusions: Implementation of child contact screening and IPT is suboptimal. This component needs to be strengthened to prevent the children becoming the future pool of infections and progression of infection to disease state.

Keywords: Child contacts, screening, Isoniazid Preventive Therapy

INTRODUCTION

India accounts for one fourth of the global tuberculosis (TB) burden. Annually out of 9.6 million new cases globally, around 2.2million are reported from India and tuberculosis is one among the top ten causes for child mortality[1]. Most of the child tuberculosis cases are house hold contacts of adult sputum smear positive pulmonary TB (PTB) cases[2].

The risk of development of disease from infection stage is highest i.e. around 43% in less than one year children and around 24% in 1-5 years children[3]. It is

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also influenced by various factors like age at infection, nutrition, immunity, genetic factors and magnitude of infection which are all directly associated with poverty, poor nutrition state, overcrowding, illiteracy, etc

National tuberculosis control programs in many countries recommend contact screening and Isoniazid preventive therapy (IPT) particularly for children less than six years, but it is not given high priority and not considered as essential tuberculosis control activities[4]. Revised national tuberculosis control program (RNTCP) in India recommends screening of all less than six years contacts. Symptomatics are further investigated and treated. Whereas asymptomatics are put on Isoniazid Preventive Therapy (IPT), where in 5mg per kg daily dose of Isoniazid given for six months[1].

In countries like India where prevalence of HIV is high and tuberculosis being the commonest opportunistic infection, more and more young adults who are parents of young children are getting infected and these children

are at high risk of tuberculosis infection. There are very few studies on this topic in India and hence remains highly less investigated. The present study will be an endeavor to know its extent of implementation and factors affecting it.

MATERIAL AND METHOD

This was a cross sectional study conducted in three districts of Karnataka. The Three districts were selected by simple random sampling using lottery method from total districts in Karnataka. Three districts selected were Chitradurga, Ramanagara and Bangalore urban, and then three Tuberculosis units were selected by simple random sampling technique using lottery method, one from each of the three districts. Three TB units(TBU) selected were Jagajeevan rao nagara TB unit form Bangalore, Kanakapura TB unit from Ramanagara district and Chitradurga TB unit from Chitradurga district.

All diagnosed TB patients initiated on treatment are registered in a TB register at Tuberculosis Units, which are maintained by a paramedical supervisory staff (also called as Senior Treatment Supervisor). Using these treatment registers and patient treatment cards, all new and retreatment smear positive pulmonary TB patients who started treatment at least six month before our study i.e. last quarter of 2014 (Oct-Dec) and first quarter of 2015 (Jan-Mar) were identified. Households of all these cases were traced using the address details given in the card. An interview of the patient or head of the household was conducted in the local language (Kannada) by trained field investigators using a semi-structured, pretested interview schedule, after taking informed consent. Information was collected on the number of total household contacts and contacts aged <6 years, whether these child contacts (<6years) were screened for TB disease, the number diagnosed with TB disease and in its absence initiation on Isoniazid preventive therapy (IPT), its compliance and reasons for it if compliance was found to be poor. All the households willing to take part in the study were included and those who were not willing, not available even after three visits and those who were transferred out were excluded from the study. Approximately 10% of the cases were cross verified by the principal investigator and Co-Investigator to assess the validity and reliability of the information collected by the trained field investigators. Data was entered into a structured format created in Microsoft Excel, cross verified and compared for consistency and analyzed.

Case definitions: A **sputum smear positive** Pulmonary TB patient is defined as "A patient with at least 1initial sputum smear examinations (direct smear microscopy) positive for acid-fast bacilli (AFB) in a well functioning External Quality Assessment (EQA) system.

Household members of a sputum positive TB patient were defined as all persons who have food from the same kitchen as that of the sputum positive TB patient. A household contact for this study was defined as "a child aged less than 6 years of age who lives or has lived (irrespective of the duration) within the household of the smear positive TB patient during the course of his/her disease (after the onset of symptoms) and till the end of treatment".

Head of the family or households is the person who takes decisions in the family with respect to health seeking, health expenditure, marriages, preparation of food items etc. He/she need not be the person who is the oldest (by age) or higher earning capacity or even the gender.

RESULTS

In this cross sectional study households of all sputum smear positive PTB cases registered from October 2014 to March 2015 i.e. at least six months before our study began were included.

Out of the 651 patients registered, 621 (95.39%) patients were visited, 30 couldn't be visited as they had migrated out of area and some houses were locked on repeated visits. Number of new cases registered were 485(74.56%), 146(22.37%) were retreatment cases and 20(3.06%) were multi drug resistant cases.

110 Contacts <6years were identified by household visits. 41(37.27%) of the contacts were between the age group of 2-4 years. 59(53.63%) of the child contacts were males. And 48(43.63%) had their parents as index case as shown in Table No.1.

Out of 110 child contacts, 15 (13.63%) Contacts were not screened for TB by the health care workers. 95(86.36%) contacts were screened for TB out of which 2(1.18%) were diagnosed to be having TB disease and were on anti tuberculosis treatment(ATT) , 22(20.00%) of the contacts didn't start IPT,71(64.54%) were initiated with IPT ,53(48.18%) of the contacts had incomplete therapy as they felt their children were healthy and don't

need the therapy anymore Finally only 18(16.36%) completed the IPT therapy as shown in Table.2&3.

Table 1: General Information of the child contacts

Variable	Subcategory	Total	Percentage
Total		110	100
Age(years)	<2	35	31.81
	2-4	41	37.27
	4-6	34	30.90
Gender	Male	59	53.63
	Female	51	46.36
Relationship with the index case			
	Parent	48	43.63
	Grand parent	19	17.27
	Others	43	39.09

Table 2: Distribution of household contacts according to IPT status

Status	Number	Percentage
Number of eligible contacts visited	110	100
Contacts screened for TB	95	86.36
Contacts initiated on IPT	71	64.54
Contacts with incomplete therapy	53	48.18
Contacts who completed the IPT therapy	18	16.36

Table 3: Distribution of the household contacts according to the reasons for not being on the IPT

Reasons	Number	Percentage
Contacts were not screened for TB	15	13.63
Contacts refused to start the drugs	22	20.00
Contacts were diagnosed to be having TB disease and were on ATT	2	1.18
Total s	39	35.45

DISCUSSION

The study results suggest that IPT component of the RNTCP is not effectively implemented. This component must be given priority as progression from infection to disease is highest among infants followed by children 1-5yrs of age and moreover children <5yrs are at highest risk developing most severe forms of disease like milliary and meningeal tuberculosis.

Out of 110 eligible contacts only 95(86.36%) were screened for the disease remaining 15(13.63%) were not screened. This reflects lack of motivation and poor training of the field staff in this regard. Similar findings were reported by a study in Tamil nadu[5]. Among the screened contacts 22 (20.00%) didn't start IPT as elders in the houses felt it's not needed and preferred to send their children to relatives houses rather than putting them on IPT. This explains the lack of awareness and poor knowledge regarding the disease transmission and its severity in the community[6].

Among the 71(64.54%) who were initiated with IPT, 53(48.18%) of the contacts had incomplete therapy as they felt their children were healthy and don't need the therapy anymore. This high rate of incomplete therapy also indicates that the present six months duration of IPT is longer and difficult to maintain the compliance in supposedly healthy children, hence if some shorter and user friendly regimens are formulated the compliance rate could be increased. This was also recommended by a mixed method study in Bhopal[7].

Poor documentation of the IPT status was observed in majority of the cases. Very few patient cards had details about the status updates after initiation of IPT. Hence if separate cards are made for child contacts it becomes customary to update the status after starting the therapy. It was also opined by Rekha et al. in a similar study[8].

Finally only 18(16.36%) of the Contacts completed the IPT therapy. Similar poor performances were reported by various studies[2, 5, 9]. This poor performance reflects the gaps in the implementation of the programme . Hence this much neglected aspect of child contact screening and IPT prefers importance and priority to decrease the prevalence of child TB and future pool of infections.

RECOMMENDATIONS

The study results show that there is suboptimal implementation of IPT component of the RNTCP and it needs to be strengthened. All child contacts of the sputum smear positive cases must be screened for the

disease symptoms and if asymptomatic must all be started with IPT.

All the field staff must be sensitized and trained periodically regarding the importance and process of screening and IPT. In turn they should create awareness in the communities regarding the need for screening and IPT.

Majority of patient treatment cards were not having details regarding child contacts and there IPT status. Some cards mentioned only the number of children, some mentioned IPT started but none mentioned about completion status, hence maintaining separate registers and IPT cards may improve follow ups and overall performance. And all these must be monitored and evaluated by the programme managers to achieve national and global TB control.

CONCLUSION

The study highlights the gaps in child contact screening and IPT component of the RNTCP. Good numbers of eligible children were not screened and among the children who were started with IPT majority of them had incomplete therapy.

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Analysis of Methanolic extract of Secondary Metabolites Released by *Candida glabratus* using GC-MS and Evaluation of Its Antimicrobial 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. Thirty nine bioactive compounds were identified in the methanolic extract of *Candida glabratus*. The identification of bioactive chemical compounds is based on the peak area, retention time molecular weight and molecular formula. *Coriandrum sativum* was very highly antifungal activity (6.80±0.25)mm. The results of anti-fungal and anti-bacterial activity produced by *Candida glabratus* showed that the volatile compounds were highly effective to suppress the growth of *Penicillium expansum* (5.95±0.20) and *Escherichia coli* (5.900±0.22).

Keywords: *Candida glabratus, GC-MS, Antifungal and Antibacterial, Secondary metabolites.*

INTRODUCTION

There are two widely cited potential virulence factors that contribute to the pathogenicity of *C. glabrata*. The first is a series of adhesins coded by the EPA (epithelial adhesin) genes [1-6]. These genes, located in the subtelomeric region, can respond to environmental cues that allow them to be expressed en masse so the organism can adhere to biotic and abiotic surfaces in microbial mats. This is also the suspected mechanism by which *C. glabrata* forms microbial "biofilms" on urinary catheters, and less commonly in-dwelling IV catheters. It also causes problems with dental devices, such as dentures. A major phenotype and potential virulence factor that *C. glabrata* possesses is low-level intrinsic resistance to the azole drugs[7-15], which are the most commonly prescribed antifungal (antimycotic) medications. It is still highly vulnerable to polyene

drugs such as amphotericin B and nystatin, along with variable vulnerability to flucytosine and caspofungin. However intravenous amphotericin B is a drug of last resort, causing among other side effects, chronic renal failure[16-28]. Amphotericin B vaginal suppositories are used as an effective form of treatment in combination with boric acid capsules as they are not absorbed into the blood stream[29-33]. The aims of this study were screening of the metabolite products and determination antibacterial and antifungal activity.

MATERIAL AND METHOD

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[34-39]. The spectrum of the extract was matched with the spectrum of the known components stored in the NIST library.

Growth conditions of *Candida glabratus* and determination of metabolites

Candida glabratus was isolated from dried fruit and the pure colonies were selected, isolated and maintained

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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 sixteen days at 150 rpm[40-43]. The extraction was performed by adding 50 ml methanol to 150 ml liquid culture in an Erlenmeyer flask after the infiltration of the culture. 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 GC-MS.

Determination of antibacterial and antifungal activity

The test pathogens (*Bacillus subtilis*, *Pseudomonas eurogenosa*, *Staphylococcus epidermidis*, *Escherichia coli*, *Proteus mirabilis*, *Streptococcus pyogenes*, *Staphylococcus aureus*, and *Klebsiella pneumonia*) were

swabbed in Muller Hinton agar plates. 90μl of fungal extracts was loaded on the bored wells. The wells were bored in 0.5cm in diameter. The plates were incubated at 37C° for 24 hr and examined. After the incubation the diameter of inhibition zones around the discs was measured. *Candida glabratus* was suspended in potato dextrose broth and diluted to approximately 105 colony forming unit (CFU) per ml. They were "flood inoculated onto the surface of Potato dextrose agar and then dried. Standard agar well diffusion method was followed. The plates were incubated for 48 h at room temperature. Antimicrobial activity was evaluated by measuring the zone of inhibition against the test microorganisms[44,45]. Methanol was used as solvent control. 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.

Table 1. Major phytochemical compounds identified in methanolic extract of *Candida glabratus*.

Phytochemical compound	RT (min)	Molecular Weight	Phytochemical compound	RT (min)	Molecular Weight
Methanesulfonic acid , 6-oxobicyclo[2.2.1]hept-2-yl	3.465	218.06128	5-Oxazolidinone,3-benzoyl-2-(1,1-dimethylethyl)-4-	5.753	365.166079
Cyclobut[c]inden-2-ol , decahydro-2-methyl-	3.493	180.151415	6-Acetyl-β-d-mannose	5.868	222.073953
3,3'-Methylenebis(1,5,8,11-tetraoxacyclotridecane)	3.522	392.241018	Muramic acid	5.954	251.100502
N-[2-[[2-Pyridylmethyl]amino]ethyl] aziridine	3.613	177.126597	Cyclohexanone , 4-ethoxy-	6.017	142.09938
Benzeneacetaldehyde	3.699	120.0575147	1-Nitro-2-acetamido-1,2-dideoxy-d-mannitol	6.360	252.095751
3-Benzylsulfanyl-3-fluoro-2-trifluoromethyl-acrylonitril	3.928	261.023533	8-Methylenecyclooctene-3,4-diol	6.692	154.09938
Glycerin	4.191	92.047344	1-Methyl-4-[nitromethyl]-4-piperidinol	7.270	174.100442
Propane , 2-fluoro-2-methyl-	4.231	76.0688286	Glucopyranuronamide , 1-(4-amino-2-oxo-1(2H)-pyri	7.350	443.17646
2-Bromotetradecanoic aid	7.579	306.119442	Cytidine , 5-methyl-	13.312	257.101171

***Cont...* Table 1. Major phytochemical compounds identified in methanolic extract of *Candida glabratus*.**

Tertbutyloxyformamide , N-methyl-N-[4-(1-pyrrolidinyl	8.345	252.183778	Pyrrolo[1,2-a]pyrazine-1,4-dione , hexahydro-3-(2-me	14.285	210.136827
12-Hydroxy-14-methyl-oxa-cyclotetradec-6-en-2-on	8.511	240.1725445	n-Hexadecanoic acid	14.628	256.24023
1-Methyl-4-[nitromethyl]-4-piperidinol	9.084	174.100442	γ-Thionodecalactone	14.949	186.107836
3-Trifluoroacetoxypentadecane	9.312	324.227615	3-Oxa-16-demethoxycarbonyl-16-(2-methyl-sulphiny	15.263	410.166414
2H-Oxecin-2-one , 3,4,7,8,9,10-hexahydro-4-hydrox	9.524	184.109944	1-Propyl-3,6-diazahomoadamantan-9-ol	15.240	210.173213
9-Thiabicyclo[3.3.1]non-7-en-2-ol	10.686	156.060886	12,15-Octadecadiynoic acid , methyl ester	15.990	290.22458
Nitrosothymol	10.926	179.094628	Octadecanoic acid	16.516	284.27153
d-Mannose	11.716	180.063388	Pyridazine-3-carboxylic acid , 5-cyano-4-methyl-6-ox	16.591	255.064391

Table 2. Zone of inhibition (mm) of test different bioactive compounds and standard antibiotics of medicinal plants to Candida glabratus.

Plant	Inhibition (mm)	Plant	Inhibition (mm)
Ricinus communis	3.02±0.18	Cordia myxa	3.04±0.19
Datura stramonium	3.51±0.22	Malva parviflora	3.60±0.23
Linum usitatissimum	5.08±0.21	Mentha pulegium	5.19±0.21
Diplotaxis cespitosa	6.05±0.24	Daucus carota	6.00±0.23
Cassia angustifolia	5.69±0.25	Vitex agnus-castus	5.71±0.25
Euphorbia lathyrus	5.94±0.23	Cressa cretica	5.96±0.26
Rosmarinus oficinalis	5.68±0.25	Citrus sinensis	5.81±0.21
Citrullus colocynthis	3.90±0.16	Ruta graveolens	3.90±0.18
Althaea rosea	4.99±0.21	Thymus vulgaris	5.88±0.24
Coriandrum sativum	6.80±0.25	Passiflora caerulea	6.09±0.24
Origanum vulgare	5.71±0.23	Glycine max	5.73±0.23
Urtica dioica	4.14±0.24	Brassica oleracea	4.08±0.21
Foeniculum vulgare	3.19±0.19	Olea europaea	3.00±0.19
Ocimum basilicum	4.98±0.25	Calendula officinalis	4.93±0.24
Achillea millefolia	5.38±0.26	Taraxacum officinale	3.19±0.19
Medicago sativa	3.09±0.19	Borago officinalis	3.63±0.21
Celosia argentea	3.35±0.22	Sambucus nigra	3.07±0.24
Apium graveolens	5.08±0.24	C. morifolium	6.08±0.21
Brassica rapa	6.00±0.21	Equisetum arvense	5.81±0.23
Cichorium endivia	5.71±0.25	Portulaca oleracea	5.90±0.25
Anethum graveolens	5.88±0.22	Malva neglecta	5.49±0.22
Plantago major	5.39±0.24	L. angustifolia	3.10±0.18
Linum usitatissimum	3.84±0.18	Althaea Officinalis	6.01±0.21
A. esculentus	6.07±0.22	Melissa officinalis	6.51±0.27
Malva sylvestris	6.39±0.24	Control	0.00

RESULTS AND DISCUSSION

Identification of biochemical compounds

Analysis of compounds was carried out in methanolic extract of Salvadora persica, shown in Table 1. Clinical pathogens selected for antibacterial activity namely, Bacillus subtilis, Pseudomonas eurogenosa, Staphylococcus epidermidis, Escherichia coli, Proteus mirabilis, Streptococcus pyogenes, Staphylococcus aureus, and Klebsiella pneumonia maximum zone formation against Proteus mirabilis (6.19±0.20) mm. Methanolic extraction of Candida glabratus showed notable antifungal activities against M. canis, Aspergillus flavus, Aspergillus fumigatus, Candida albicans, Saccharomyces cerevisiae, Penicillium expansum, Trichoderma viride, and Aspergillus terreus. Penicillium expansum was very highly active against Candida glabratus (5.95±0.20). In agar well diffusion method the selected medicinal plants were effective against Candida albicans Table 2. Five-millimeter diameter wells were cut from the agar using a sterile cork-borer, and 25 μl of the samples solutions (Ricinus communis (Alkaloids), Datura stramonium(Alkaloids), Linum usitatissimum (Crude), Anastatica hierochuntica (Crude), Cassia angustifolia (Crude), Euphorbia lathyrus (Crude), Rosmarinus oficinalis (Crude), Citrullus colocynthis (Crude), Althaea rosea (Crude), Coriandrum sativum (Crude), Origanum vulgare (Crude), Urtica dioica (Crude), Foeniculum vulgare (Crude), and Ocimum basilicum (Crude), Achillea millefolia, Medicago sativa, Celosia argentea, Apium graveolens, Brassica rapa, Cichorium endivia, Anethum graveolens, Plantago major, Linum usitatissimum, A. esculentus, Malva sylvestris, Cordia myxa, Malva parviflora, Daucus carota, Vitex agnus-castus, Cressa cretica, Citrus sinensis, Ruta graveolens, Thymus vulgaris, Passiflora caerulea, Glycine max, Brassica oleracea, Olea europaea, Taraxacum officinale, Borago officinalis, Sambucus nigra, C. morifolium, Equisetum arvense, Portulaca oleracea, Portulaca oleracea, Malva neglecta, L. angustifolia, Althaea Officinalis, and Melissa officinalis) were delivered into the wells. Coriandrum sativum was very highly antifungal activity (6.80±0.25) mm.

CONCLUSION

Candida glabratus 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 Candida glabratus can be useful.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: In this research, all experimental protocols were approved under the Department of Biology, College of Science for women, University of Babylon, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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Using GC-MS Technique for Analysis of Bioactive Chemical Compounds of *Penicillium Italicum* and Determination of its Anti-Microbial Activity

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ABSTRACT

The aims of our study were analysis of the bioactive chemical products and determination of antibacterial activity. Twenty eight bioactive compounds were identified in the methanolic extract of *Penicillium italicum*. The identification of bioactive chemical compounds is based on the peak area, retention time molecular weight and molecular formula. The results of anti-fungal and anti-bacterial activity produced by *Penicillium italicum* showed that the volatile compounds were highly effective to suppress the growth of *Aspergillus terreus* 6.302±0.20 mm and *Proteus mirabilis* 6.08±0.21 mm. In agar well diffusion method the selected medicinal plants were effective against *Penicillium italicum*. *Melissa officinalis* was very highly antifungal activity 6.70±0.25 mm.

Keywords: *Anti-Microbial, Bioactive Chemical Compounds, GC-MS, Penicillium italicum.*

INTRODUCTION

Penicillium species are present in the air and dust of indoor environments, such as homes and public buildings. Species of *Penicillium* are ubiquitous soil fungi preferring cool and moderate climates, commonly present wherever organic material is available. Saprophytic species of *Penicillium* and *Aspergillus* are among the best-known representatives of the Eurotiales and live mainly on organic biodegradable substances. The ability of these *Penicillium* species to grow on seeds and other stored foods depends on their propensity to thrive in low humidity and to colonize rapidly by aerial dispersion while the seeds are sufficiently moist. Some *Penicillium* species affect the fruits and bulbs of plants, including *P. expansum*, apples and pears; *P. digitatum*, citrus fruits; and *P. allii*, garlic. *Penicillium* growth can still occur indoors even if the relative humidity is low, as long as there is sufficient moisture available on a given surface. The objectives of our study were determination of the bioactive products and evaluation of antibacterial and antifungal activity.

MATERIAL AND METHOD

Gas chromatography – Mass Spectrum analysis

Penicillium italicum 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. Interpretation of mass spectrum was conducted using the database of National Institute of Standards and Technology (NIST, USA).

Growth conditions of *Penicillium italicum* and determination of metabolites

Penicillium italicum was isolated and maintained in potato dextrose agar slants [19-21]. Spores were grown in a liquid culture of potato dextrose broth (PDB) and incubated at 25ºC in a shaker for sixteen days at 150 rpm. The extraction was performed by adding 50 ml methanol to 150 ml liquid culture in an Erlenmeyer flask after the infiltration of the culture. Products was separated from the liquid culture and evaporated to dryness with a rotary evaporator at 45ºC [22,23]. 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 GC-MS.

Determination of antibacterial and antifungal activity

Nine of tested bacteria were swabbed in Muller Hinton agar plates. 90μl of fungal extracts was loaded on the bored wells. The wells were bored in 0.5cm in diameter. The plates were incubated at 37C° for 24 hr and examined [26-28]. After the incubation the diameter of inhibition zones around the discs was measured. *Penicillium italicum* isolate was suspended in potato dextrose broth and diluted to approximately 105 colony forming unit (CFU) per ml. They were "flood inoculated onto the surface of Potato dextrose agar and then dried.

Standard agar well diffusion method was followed [29-33]. Five-millimeter diameter wells were cut from the agar and 30 *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. Methanol was used as solvent control. Amphotericin B and fluconazole were used as reference antifungal agent [34-41]. The tests were carried out in triplicate. The antifungal activity was evaluated by measuring the inhibition-zone diameter observed after 48 h of incubation. 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.

Table 1. Major phytochemical compounds identified in methanolic extract of *Penicillium italicum*.

Serial No.	Phytochemical compound	RT (min)	Molecular Weight
1.	DL-Arabinose	3.173	150.052823
2.	Dihydroxyacetone	3.504	90.031694
3.	4-Decene , 2,2-dimethyl - ,(Z)-	4.025	168.1878
4.	2,5-Dimethyl-4-hydroxy-3(2H)-furanone	4.271	128.047344
5.	Pentanoic acid , octyl ester	4.849	214.19328
6.	: 9-Oxabicyclo[6.1.0]nonan-4-ol	5.204	142.09938
7.	4H-Pyran-4-one , 2,3-dihydro-3,5-dihydroxy-6-methyl	5.450	144.042258
8.	d-Gala-l-ido-octonic amide	5.971	255.095416
9.	4H,5H-Pyrano[4,3-d]-1,3-dioxin , tetrahydro-8a-meth	6.383	158.094295
10.	9-Thiabicyclo[3.3.1]non-7-en-2-ol	7.001	156.060886
11.	Pyrrolizidine-3-one-5-ol , ethyl ether	7.241	169.110279
12.	7-Methyl-Z-tetradecen-1-ol acetate	7.785	268.24023
13.	Dodecanoic acid , 3-hydroxy-	8.305	216.1725445
14.	Z-8-Methyl-9-tetradecenoic acid	8.923	240.20893
15.	Tertbutyloxyformamide , N-methyl-N-[4-(1-pyrrolidinyl	9.816	252.183778
16.	1H-Purin-2-amine , 6-methoxy-N-methyl-	10.926	179.080709
17.	Benzocycloheptano[2,3,4-lj]isoquinoline , 4,5,6,6a-	11.098	341.162708
18.	1-Oxaspiro[4.5]decan-3-carboxylic acid ,2-oxo-4-cy	11.469	251.115758
19.	1-(3-Methyl-2-butenyl)-3,6-diazahomoadamantan-9-	13.329	236.188864
20.	N-(O-Nitrophenylthio)-l-leucine	13.644	284.083078
21.	Benzenemethanol ,3-hydroxy-5-methoxy-	14.296	154.062994
22.	Benzenepropanoic acid , 3,5-bis(1,1-dimethylethyl)-	14.548	292.203844
23.	n-Hexadecanoic acid	14.634	256.24023
24.	10-Methyl-8-tetradecen-1-ol acetate	14.828	268.24023
25.	2(1H)-Naphthalenone , 4a,5,6,7,8,8a-hexahydro-6-	15.646	234.16198
26.	2-[5-(2,2-Dimethyl-6-methylene-cyclohexyl)-3-methyl	16.133	312.208931
27.	cis- Vaccenic acid	16.322	282.25588
28.	Octadecanoic acid	16.493	284,27153

Table 2. Zone of inhibition (mm) of test different bioactive compounds and standard antibiotics of medicinal plants to *Penicillium italicum*.

S. No.	Plant	Inhibition (mm)	S. No.	Plant	Inhibition (mm)
1.	Datura stramonium	3.39±0.20	16.	Malva parviflora	3.38±0.21
2.	Linum usitatissimum	5.01±0.22	17.	Mentha pulegium	5.05±0.22
3.	Diplotaxis cespitosa	6.05±0.20	18.	Daucus carota	6.00±0.23
4.	Cassia angustifolia	5.73±0.23	19.	Vitex agnus-castus	5.61±0.23
5.	Citrullus colocynthis	3.96±0.18	20.	Ruta graveolens	3.99±0.18
6.	Ocimum basilicum	4.82±0.22	21.	Calendula officinalis	4.95±0.22
7.	Achillea millefolia	5.58±0.23	22.	Taraxacum officinale	3.09±0.17
8.	Medicago sativa	3.06±0.18	23.	Borago officinalis	3.33±0.20
9.	Celosia argentea	3.37±0.20	24.	Sambucus nigra	4.08±0.22
10.	Apium graveolens	5.04±0.22	25.	C. morifolium	6.01±0.21
11.	Brassica rapa	6.07±0.21	26.	Equisetum arvense	5.53±0.23
12.	Cichorium endivia	5.60±0.23	27.	Portulaca oleracea	5.86±0.24
13.	Linum usitatissimum	3.93±0.18	28.	Althaea Officinalis	5.84±0.21
14.	A. esculentus	4.92±0.21	29.	Melissa officinalis	6.70±0.25
15.	Malva sylvestris	6.57±0.25	30.	Control	0.00

RESULTS AND DISCUSSION

Analysis of compounds was carried out in methanolic extract of Penicillium italicum, shown in Table 1. Escherichia coli, Bacillus subtilis, Pseudomonas eurogenosa, Staphylococcus aureus, Staphylococcus epidermidis, Proteus mirabilis, Streptococcus pyogenes, and Klebsiella pneumonia selected for antibacterial activity, and we found Proteus mirabilis 6.08±0.21 mm recorded maximum zone formation against Penicillium italicum. Methanolic extraction of Penicillium italicum showed notable antifungal activities against M. canis, Aspergillus flavus, Aspergillus terreus, Aspergillus fumigatus, Candida albicans, Penicillium expansum, Trichoderma viride, and Saccharomyces cerevisiae. Aspergillus terreus was very highly active against Penicillium italicum 6.302±0.20. In agar well diffusion method the selected medicinal plants were effective against Penicillium italicum Table 2. Five-millimeter diameter wells were cut from the agar using a sterile cork-borer, and 25 μl of the samples solutions Datura stramonium(Alkaloids), Linum usitatissimum (Crude), Anastatica hierochuntica (Crude), Cassia angustifolia (Crude), Citrullus colocynthis (Crude), Ocimum basilicum (Crude), Achillea millefolia, Medicago sativa, Celosia argentea, Apium graveolens, Brassica rapa, Cichorium endivia, Linum usitatissimum, A. esculentus, Malva sylvestris, Malva parviflora, Daucus carota, Vitex agnus-castus, Ruta graveolens, Taraxacum officinale, Borago officinalis, Sambucus nigra, C. morifolium, Equisetum arvense, Portulaca oleracea, Portulaca oleracea, Althaea Officinalis, and Melissa officinalis were delivered into the wells. Melissa officinalis was very highly antifungal activity 6.70±0.25 mm.

CONCLUSION

Twenty eight bioactive chemical constituents have been identified from methanolic extract of the *Penicillium italicum* by (GC-MS). In vitro antimicrobial determination of bioactive chemical products of *Penicillium italicum* forms a primary platform for further phytochemical and pharmacological investigation for the development of new potential antibacterial and antifungal compounds.

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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 for Women, Hillah city, Iraq.

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Description of Parasitic Infections in Honeybees *Apis sp* in the Middle Euphrates Region of Iraq

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ABSTRACT

The present study was carried out to investigate the parasitic infections of honeybees,300 adult honey bee collected from apiaries in the Middle Euphrates region (province of AL- Diwaniyah, AL-Najaf ,Babylon, , Karbala),there were three strains of honeybees in that area included, *Apis mellifera syriaca* , *Apis mellifera syriaca carnica* , *Apis melliferasyriaca ligustica,* all these strains registered were infected with both Parasites *Varroa. destructor*, *Nosema apis* where the proportion of total infection was 49.44% ,a strain was less parasitic infection *Apis melliferasyriaca carnica* ,it was 8.66% while strain *Apis mellifera syriaca* more that where 22.66% ,the results also showed significant differences in the percentage of infection between the strains of bees at the probability P<0.05. The results also showed that the incidence of *Varroa* were 23.33% as single infection, while the prevalence of *Nosema* was 7.33% as single infection and 18.66% as common infection. The results also indicated that the highest percentage of infection was recorded in the province of Najaf which was 44%, while the lowest percentage of infection was in the province of Diwaniyah, where it reached 31%,and the present study didn't find a relationship between provinces and percentage   of parasitic infections in bees.

Keyword: *Honybees, Nosema, Varroa, Apis sp.*

INTRODUCTION

Honeybees are insects that come under order Hymenoptera and family Apidae and showed complete metamorphosis. Honeybee species are characterized by particular functional traits that facilitate pollination services to a greater or lesser degree [1]. Based on morphometric, behavioral and biogeographical studies, 26 subspecies have been identified [2,3]. Big tasks for little insects: the worker honeybee is of great importance to humans .It is essential for pollination of a wide number of crop plants, making them an important part of food production. A large proportion of our food is produced, to some extent, with the help of bee and other insect pollination. That is why protecting and improving the health of bees is so important, the bee is a social insect of economic importance. It offers numerous food and medical products. It is considered the only unsatisfactory for human its conversely acting through products particularly stinging to increase human immunity [4]. The solution is the most important factor in the Clipboard on the biodiversity of flowering plants but a comprehensive effect on living organisms through artificial insemination breeding Cross-pollination, It is an important factor to achieve environmental stability and the presence of bees and production capacity is a measure of the health of the environment and indication of a place of weakness and loss of balance and guide to correct that balance [5]. Bees belong to the class of insects rank membrane wings Hymenoptera and the platoon *Apidae*. There are nine types of bees *Apidae* genus: eight types exist in Asia and one in the continents of Europe and Africa and *Apis millifera* is the European honeybees. Hybridization among several possible breeds and European honeybees have spread throughout the world through human [6]. Although the number of honey bee colonies has grown

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across the world in the past 50 years, poor bee health has reached alarming levels in some regions of the world. One of the main causes, and one of the honey bees worst enemies, is a tiny mite called *Varroa destructor*, it is an external, a deadly and dangerous bee parasite. In addition to the threat posed by the *Varroa* mite itself, there is also the danger of secondary infection from various mite-vectored diseases, which has also become more widespread and additionally weakened the bee colonies, the parasitic *Varroa* mites – much like ticks – transmit diseases that often prove fatal to adult honey bees and their brood, symptoms of a parasite *varroa* a beehive warped the wings, legs and abdomen ,the inability of the bees to fly and the infected brood Vinaigrette and irregular in shape [7]. The bees are exposed to another parasite called *Nosema*: A microbial diseases affecting bees, it is more prevalent in the world bee diseases especially in cold regions where in bees stay inside cells along winter and causes through primary parasite, *Nosema apis* affects disease in worker bees, dilutes and reduces its activity in aviation and shortens life, also it leads to a damage of the ovaries of the Queen, brood production and reduces symptoms within a week of the injury, bees are seen crawling on the floor or on cells as well as fly for short distances and then it drops [8].This study was designed to a description of parasitic infections in honey bees in the Middle Euphrates region of Iraq.

MATERIALS AND METHOD

Collection of Samples

Samples were 300 bees (75 samples of each province) collected from apiaries in the Middle Euphrates region of Iraq, which includes four provinces: AL-Diwaniyah, AL-Najaf, Babylon, Karbala.

Diagnosis of *Varroa*

Field Diagnosis

One can see mites (female) as featured on the adult

bees with the naked eye during test cell [9] Laboratory diagnosis

Isolate external parasites of bees is a sample taken from worker (workers) ,about 300 bees , put in a plastic bag and then sprayed ether into the bag. Dropping the *Varroa* (kind of mites) of bees can be seen by lifting bag in the direction of light [10]; then, putting the bees suspect in alcohol 70%, cut off the wings and legs related to chest, which are separated from the rest of the body and placed in sodium hydroxide for 24 hours. This leads to melt tissue and when you remove Prothoracic collar, the rods are evident and can be examined under a microscope to see a mites rods [11].

Diagnosis of *Nosema apis*

Field diagnosis

300 bees were examined .Gastrointestinal tract is attracted from the back of the abdomen and the stomach is examined, the right stomach: Dark red. The wrinkles appear clear on the stomach, the color of which is fern, the infected stomach. Its organs are grayish white and the infection becomes swollen [12].

Laboratory diagnosis

A part of the stomach was examined under a microscope without the dye of the oval-colored oval vesicles as elliptic (3-6) μm in length (1-2) microns wide. *Nosema* diagnosis is done through the traditional method for diagnosing. *Nosema* infections has been to crush adult worker abdomens in a small amount of water and examine the lysate (fluid plus cellular debris from crushed bees) for spores under a microscope [13].

Statistical analysis.

The data were analyzed by chi-square test under probability level $P<0.05$, so as to study the correlation between different strains, provinces, type of infection with the prevalence of the parasites.

Table 1: Shows Prevalence rates types of honeybees in the Middle Euphrates region of Iraq

Number of bees examined	Bees strains	Examined No	Infected No.	%
300	Apis mellifera syriaca	100	68*	22.66
	Apis melliferasyriaca carnica	100	26	8.66
	Apis melliferasyriaca ligustica	100	54	18
	Total	**300**	**148**	**49.33**

*refer to significant from other at P<0.05

א ^{2} calculated:12.87   א ^{2} tablets:2.920

Table 2. Show the types of infection with *Varroa destructor &Nosema apis*

Infection type	Infected No.		%
One type of infection	70	V. destructor	23.33*
	22	*N. apis*	7.33
Two types of infection	56	*V. destructor + N. apis*	18.66
Total	148		49.33

*refer to significant from other at P<0.05

א ^{2} calculated:37.36   א^2 tablets:2.920

Table 3. Prevalence of V. *destructor & N. apis* in honeybee in Middle Euphrates province
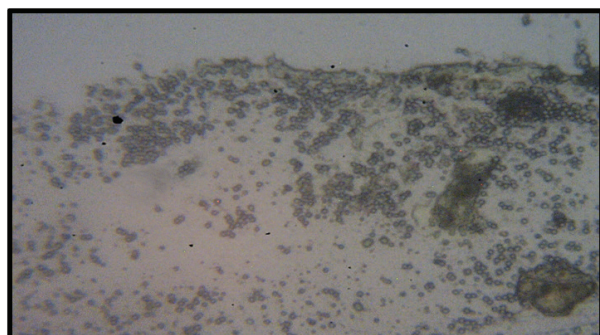
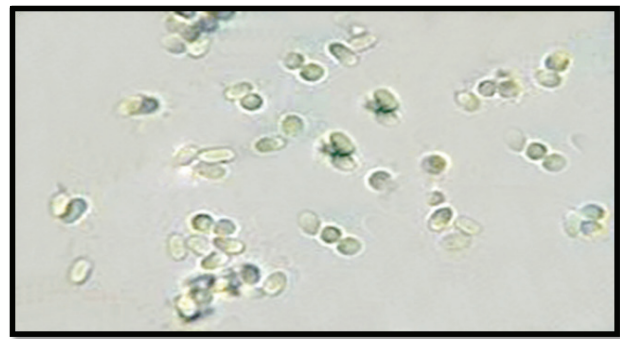| Province	Examined No.	Infected No.	%
AL-Diywanyh	75	31	31
AL-Najaf	75	44	44
Babylon	75	34	34
Karbala	75	39	39
Total	300	148	49.33

P<0.05

א ^{2} calculated:1.98   א ^{2} tablets:2.353

Figure 1. *V. destructor* is visible to the naked eye and look somewhat like tick.

Figure 2. *Nosema apis* spores in fluid plus cellular debris from crushed bees (40x)

Figure 3. *Nosema apis* spores in fluid plus cellular debris from crushed bees (400x)

RESULTS AND DISCUSION

There are thousands of different species of bees in the world, but the two most important for beekeeping are the western honey bee, *Apis mellifera*, and the eastern honey bee, *Apis cerana*. Bees are social insects living in hives consisting of one queen, many workers, all female, and a few drones. Bees, like all animals including humans, are susceptible to bacteria, viruses, external and internal parasites [14]. The current study examines 300 samples of adult bee collected from apiaries in the Middle Euphrates region of Iraq. The results in Table (1) indicate that the most important honeybees strains were incident in the Middle Euphrates region of Iraq as: *Apis mellifera syriaca , Apis melliferasyriaca carnica, Apis melliferasyriaca ligustica*. Also the results show that the highest prevalence of infestation of parasites was 22.66% of *Apis mellifera syriaca*, while the lowest prevalence was 8.66% (of *Apis melliferasyriaca carnica*). Static analysis of the results revealed significant differences between three strains of bees. A presence of parasitic infections was observed also in this study. The reason for the distribution of *Apis mellifera syriaca* may be due to its suitability and adaptation to the dry and warm climates that help to cope with the high temperatures in the summer, in addition to that this type of bees have the intensity to put eggs depending on the amount of pollen available [15]. The results in table2 indicate that honeybee types were infected with both V*arroa destructor* (ecto-parasite) and *Nosema apis* (endo-parasite). It is noted that single infection rate with v. *destructor* was 23.33% which is the highest percentage registered, while single infection rate with *N.apis* was 7.33 %. This is very similar to results found by other studies[16, 17], while the rate of common infection with both parasites mentioned above was 18.66%. We also observe V*arroa* mites by the naked eye as in Figure 1, and *Nosema* under microscope as in Figure 2. External parasite has four pairs of legs

with oval shape and wider than a length ranging from its dimensions in width (1.5-1.58) mm and length (1.09 – 1.05) mm, hard shell, while Auburn-colored female, male white yellowish and smaller[18]. The reason of spread of *Virroa* may be due to cell proliferation, these parasite contributes to the transmission of diseases between communities and cuddling as well as cells close together, Transfer honey bees by trains, cars and planes to distant places, and all this led to the spread of *Virroa* mites in many parts of the world such as Iraq [5]. Nosema disease shortens the life of the workers of bees, which leads to the lack of quantity of honey produced in the cell and the queen infected with this disease significantly has less eggs production than required to change the queen of modern and healthy, also affects the shortage in the number of workers as a result of this disease on the amount of brood produced in the cell [19]. The disease is present at low levels at all times but the problem only arises when conditions are favorable for the growth of *Nosema*. The infection is caused by the presence of bees for a long time during the winter inside the cell and cannot go out to the fields because of cold and weather fluctuations and this parasite infects both Queen and female workers and males. Results in the Table (3) indicate that the highest prevalence of parasites in this study was in AL-Najaf province where the ratio was 44%, while the lowest prevalence recorded in AL-Diwaniyah province which was 31% , the reason for the high rate of infection of bees with *V. destructor & N. apis* parasites in the Middle Euphrates provinces of Iraq may be due to a high humidity, moderate temperature Analysis of results showed there were no significant differences between provinces and presence of parasites in bees.

CONCLUSION

Our report revealed that three strains of honeybees in the Middle Euphrates region of Iraq, included, *Apis mellifera syriaca , Apis mellifera syriaca carnica , Apis melliferasyriaca ligustica*, all these strains registered were infected with both Parasites *Varroa. destructor*, *Nosema apis*

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: In this research, all experimental protocols were approved under the Department of environment. College of Science, University of AL Qadisiyah, AL Diwaniyah, Qadisiyah, Iraq and all experiments were carried out in accordance with approved guidelines.

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Determination of Alkaloid Compounds of *Datura Stramonium* Using Gc-Ms and Ftir and Evaluation of its Antibacterial, Antifungal and Anti-Diabetic Activity

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ABSTRACT

The aim of this study is to assess the compounds of alkaloids extracts from the leaves of Datura stramonium, which can be the basis for the synthesis of new antibiotics. In this study, the alkaloid compounds of Datura stramonium have been evaluated. GC-MS analysis of alkaloid leaves ethanolic extract of Datura stramonium revealed the existence of the Ethyl iso-allocholate, D-asycarpidan-1-methanol, acetate (ester), 3-(1,5-Dimethyl-hexyl)3a,10,10,12b-tetramethyl1,2,3,3a 4,6,8,9,10,10a,11,12,12a,12b-tetradec-ahydro -benzo[4,5] cyclohept,2, 7-Diphenyl-1,6-dioxopyridazino [4,5:2,3] pyrrolo[4,5-d] pyridazine, 3,8,8-Trimethoxy-3-piperidyl-2,2-benaphthalene-1,1,4,4- tetrone, [5β] Pregnane3,20β-diol,14α,18α-[4-methyl,3-oxo-[1-oxa-4-azabutane-1,4-diyl], diacetate, 1-Monolinoleoylglycerol trimethylsilyl ether, and 17-[1,5-Dimethylhexyl]-10,13-dimethyl-3sstyrylhexadecahydrocyclopent a[a]phenathren-2-one. The FTIR analysis of Datura stramonium leaves proved the presence of alkanes, and alkyl halide, Amine, Aldehyde, and Alkane which shows major peaks at 875.68, 1018.41, 1149.57, 1238.3, 1269.16, 1740.51, 2330.01, 2341.58, 2854.65, 2910.58, 2926.01, and 3010.88. Clinical pathogens were selected for antibacterial activity namely, Bacillus subtilis, Salmonella typhi, Staphylococcus aureus, Proteus mirabilis, Escherichia coli, Streptococcus faecalis, Streptococcus pyogenes and Klebsiella pneumonia. Datura stramonium has maximum zone against Staphylococcus aureus (5.895±0.20).

Keywords: *Alkaloids, Datura stramonium, GC-MS, Bioactive, Natural compounds.*

INTRODUCTION

Datura stramonium is annual herb, stem erect with spreading branches above. Common in the waste land, fields and gardens in Baghdad district. Leaves, seeds and roots contain the alkaloid daturine (amixture of the two alkaloids hyoscyamine and atropine) and also contains scopolamine alkaloid (Hyosine) acids, tannin and fatty oil. Plants are rich source of secondary metabolites with interesting biological activities. Several plant products

have been shown to exert a protective role against the formation of free radicals and playing a beneficial role in maintaining disease condition. Very few of these chemicals are toxic also. The main toxic alkaloids in *D. stramonium* are the tropane alkaloids of which atropine (dl-hyoscyamine) and scopolamine (l-hyoscine). Atropine and scopolamine are competitive antagonists of muscarinic cholinergic receptors and are central nervous system depressants. Intentional poisoning with *D. stramonium* has also been reported in several cases, namely a fatal poisoning with *D. stramonium* for its mind altering properties and the eating and chewing of Datura in a suicides attempt. The toxicity of *D. stramonium* in grazing animals have been suspected by livestock owners and field veterinarians especially at time of drought or after ingesting freshly harvested maize that will be used for ensiling and heavily contaminated with

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young *D. stramonium*. Successful extraction is largely dependent on the type of solvent used in the extraction procedure. The aims of our study were determination of chemical compounds and evaluation of antimicrobial activity.

MATERIAL AND METHOD

Collection and Preparation of Plant Material

In this research, Datura Stramonium leaves were 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.

Gas Chromatography-Mass Spectroscopy (GC-MS) and Fourier Transform Infrared Spectrophotometer (FTIR) analysis

GC-MS analysis of the ethanol extract of Datura stramonium was carried out using a (Agilent 7890A series, USA). The powdered sample of Datura Stramonium 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 *Datura Stramonium*

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. The tests were carried out in triplicate [27,28].

Table 1. **Compounds present in the alkaloid extract of *Datura stramonium* using GC-MS analysis.**

Serial No.	Alkaloid compound	Formula	Molecular Weight
1.	Ethyl iso-allocholate	$C_{26}H_{44}O_5$	436
2.	D-asycarpidan-1-methanol, acetate (ester)	$C_{20}H_{26N2}O_2$	326
3.	3-(1,5-Dimethyl-hexyl)3a,10,10,12b-tetramethyl1,2,3,3a4,6,8,9,10,10a,11,12,12a,12b-tetradecahydro-benzo[4,5] cyclohept	$C_{30}H_{50}$	410
4.	2,7-Diphenyl-1,6-dioxopyridazino[4,5:2,3] pyrrolo[4,5-d]pyridazine	$C_{20}H_{13N5}O_2$	355
5.	3,8,8-Trimethoxy-3-piperidyl-2,2-benaphthalene-1,1,4,4-tetrone	$C_{28}H_{25}NO_7$	487
6.	[5β]Pregnane3,20 β-diol,14α,18α-[4-methyl,3-oxo-[1-oxa-4-azabutane-1,4-diyl], diacetate	$C_{28}H_{43}NO_6$	489
7.	1-Monolinoleoylglycerol trimethylsilyl ether	$C_{27}H_{54}O_4Si_2$	498
8.	17-[1,5-Dimethylhexyl]-10,13-dimethyl-3-sstyrylhexadecahydrocyclopenta[a]phenathren-2-one	$C_{35}H_{52}O$	488

Table 2. Fourier-transform infrared spectroscopic profile solid analysis of *Datura stramonium*.

No.	Peak (Wave number cm-¹)	Intensity	Type of Intensity	Bond	Type of Vibration	Functional group assignment	Group frequency
1.	875.68	80.625	Strong	=C–H	Bending	Alkenes	650-1000
2.	1018.41	63.965	Strong	C-F	Stretch	alkyl halides	1000-1400
3.	1149.57	78.454	Strong	C-F	Stretch	alkyl halides	1000-1400
4.	1238.30	80.981	Medium	C–N	Stretch	Amine	1080-1360
5.	1269.16	82.412	Medium	C–N	Stretch	Amine	1080-1360
6.	1740.51	78.294	Strong	C=O	Stretch	Aldehyde	1720-1740

***Cont...* Table 2. Fourier-transform infrared spectroscopic profile solid analysis of *Datura stramonium*.**

7.	2330.01	69.882	Unknown	-	-	-	-
8.	2341.58	67.959	Unknown	-	-	-	-
9.	2358.94	60.564	Unknown	-	-	-	-
10.	2854.65	83.811	Strong	C-H	Stretch	Alkane	2850-3000
11.	2910.58	83.384	Strong	C-H	Stretch	Alkane	2850-3000
12.	2926.01	80.163	Strong	C-H	Stretch	Alkane	2850-3000
13.	3010.88	85.603	Medium	=C-H	Stretch	Aldehyde	2820-2850

RESULTS AND DISCUSSION

GC-MS analysis of alkaloid compound clearly showed the presence of eight compounds. The alkaloid compound, formula, molecular weight and exact mass present in Table 1. Chromatogram GC-MS analysis of the ethanol extract of Datura stramonium showed the presence of eight major peaks and the components corresponding to the peaks were determined Ethyl iso-allocholate, D-asycarpidan-1-methanol, acetate (ester), 3-(1,5-Dimethyl-hexyl)3a,10,10,12b- tetramethyl1,2,3,3a 4,6,8,9,10,10a,11,12,12a, 12b-tetradec- ahydro -benzo[4,5] cyclohept,2, 7-Diphenyl-1,6-dioxopyridazino [4,5:2,3] pyrrolo [4,5-d] pyridazine, 3,8,8-Trimethoxy-3-piperidyl-2,2-benaphthalene-1,1,4,4- tetrone, [5β] Pregnane3,20β-diol,14α,18α-[4-methyl,3-oxo-[1-oxa-4-azabutane-1,4-diyl], diacetate, 1-Monolinoleoylglycerol trimethylsilyl ether, and 17-[1,5-Dimethylhexyl]-10,13-dimethyl-3sstyrylhexadecahydrocyclopent a[a]phenathren-2-one. The FTIR analysis of Datura stramonium leaves proved the presence of alkanes, and alkyl halide, Amine, Aldehyde, and Alkane which shows major peaks at 875.68, 1018.41, 1149.57, 1238.3, 1269.16, 1740.51, 2330.01, 2341.58, 2854.65, 2910.58, 2926.01, and 3010.88 Table 2. In the current study, the anti-microbial activity of Datura stramonium 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, Bacillus subtilis, Salmonella typhi, Staphylococcus aureus, Proteus mirabilis, Escherichia coli, Streptococcus faecalis, Streptococcus pyogenes and Klebsiella pneumonia. Datura stramonium has maximum zone against Staphylococcus aureus (5.895±0.20) Figure 1. Antifungal activities against Saccharomyces cerevisiae, Trichoderma horzianum, Penicillium expansum, Aspergillus niger, Aspergillus terreus, Candida albicans, Trichoderma viride, and Microsporum canis. Datura stramonium was very highly active against Aspergillus terreus (6.98±0.20) Figure 2. 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 Datura stramonium extracts looking toward a pharmaceutical use.

CONCLUSION

Eight chemical alkaloids constituents have been identified from methanolic extract of the Datura stramonium by gas chromatogram mass spectrometry (GC-MS). In vitro antibacterial evaluation of Datura stramonium 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: These experiments were carried out in accordance with approved guidelines and all protocols were approved under the Department of Biology, College of Science for Women, Hillah city, Iraq.

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Psychosocial and Medical Aspects of Anxiety-Depressive Disorders in Diabetic Patients in Baghdad, Iraq

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ABSTRACT

Diabetes melliltus is a chronic disorder characterized by impaired metabolism of glucose due to deficiency or ineffectiveness of endogenously execrated insulin, this chronic disorder Is associated with late development of vascular, neurological and psychological complications. To determine the prevalence of ADD among the diabetic patients and to find out which psychiatric disorders are predominate and to find out the correlation between psychiatric morbidity and socio demographic data. The study sample includes 80 patients 31 male, 49 female; it was carried at the Baghdad teaching hospital, medical outpatient clinic .The period of the study was from 1ˢᵗ of june 2016 to 1ˢᵗ of june 2017, the ageʼs range of the sample is between 20-60 years old. the sample includes both types of diabetes mellitus. General health questionnaire and semi-structure interview in the sample assessment were adapted. Among these psychiatric cases depression include AD and MDD was found to be the 1ˢᵗ diagnosis 64.3% allowed by anxity disorders 35.7%. There is high psychiatric morbidity among the diabetic patients presented mainly as depression and followed by anxiety disorders in addition to a high physical complications among the total sample.

Keyword: *Psychosocial, Anxiety-depressive disorders, diabetic patients.*

INTRODUCTION

Diabetes mellitus is a chronic disorder characterized by impaired metabolism of glucose and other energy-yielding fuels as well as by the late development of vascular aadeeurological complication[1-4]. Diabetes comprises a group of disorders isvolving distinict pathogenic mechanisms, for which hyperglycemia is the common denominator. Regardless of its cause, the disease *is a*issociated with a common hormonal defect, namely, iasulin deficiency, which may be total, partial, or relative when viewed in the contest of coexisting insulin resistance. Lack of insulin effect plays a primary role in the metabolic derangemente liaked to diabetes, and hyperglycemia is turn plays an importaat role in disease-related complications [5-11]. The number of affected patients continues to rise as the 21st century begins, with current estimates excesdiag 800,000 new cases per year. Diabetes is the fourth most common reason for patient contact with an Americas physician; unfortunateiy the rate of growth of diabetes is largest in developing nations, where barriers exist to proper diagnosis and treatment. Diabetes is a leading cause of both; mortality and early disability In United States. Fortunately much is known now about the etiology, pathophysiology, treatmeat, aad organic complicationsbf diabetes and more attentios are being paid to the effects of the illness upon the diabetic's social, domestic and working life. Nevertheless, little consideration *is* given still td behavioral aspects of the management of diabetes militias especially when the affected patient has a concurrent psychiatric disorder or intellectual deficit[14]. As weakness mood swings .especially depression. Hypochondriasis, poor self – reliance, vagueness about emotional feeling impaired social relation- ship, problems in sexual identity and alteration in behavior, feeling of frustration, loneliness and dejection and attempted suicide and eating disorders [9-23].

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MATERIALS AND METHOD

The present study is cross sectional and carried out Baghdad teaching hospital, outpatient clinic. The sample randomly selected according to the base of the third selected patient (passes 2 patients and choose the 3rd one), the sample consist of 80 patients, and formal, written consent was obtained from each patients. The period of the research was from 1st of Jane 20**16 to 1** st of Jane *2017* Age range 20-60years, sex distribation 31 males' 49 females; the saispie consist oa both types of diabetes meliitus. The diabetic patients were diagnosed according to the dlagniatic criteria for diabetes meliitus (and normality) recommended by meatiened above [4]. The diagnosis was done by the patient's ph3^iclan, esciaded diabetic patients with ether physical disorders. (GJH.Q-) was developed for deteicdon of a probable case of psychiatric morbidliy among community and primary care sample.-Since its introductioan it was subjected to validity study used in prevalence estimation applied in a variety of cultoues and angauges [10]. Semi-stmctnred psychiatric interview: to validate the General health Questionnaire, all general heaIth Questionnaire (positive and negative) was examined.These items were carefully selected with the agreement of supervisor and according to interpretation of the items response a decision upon the appropriate, psychiatric cases were taken. The preliminary contacts with patients have been made using standard form of letter explaining the purpose of the study .Then each patient was administered the 30-itenis general health questionnaire followed by semi-structured interview by the researcher of each patients. The results arranged and tabulated statistically by highly qualified community medicine specialist as a statistician.

Table 1. Distribution of cases according to questionnaires and Semi-structured interview:

General health questionnaire	Semi-structured interview		
Probable cases	Cases	Not a cases	Total
Not Probable cases	34 True positive	4 False positive	38
	8 False negative	34 True negative	42
Total	42	38	80

Table 2. The distribution of patient's according to psychiatric diagnosis:

Psychiatric diagnosis	No.	%
Generalized anxiety disorder	9	22.5
Depression MDD	6	14.2
Panic disorder with or without a grand phobia	6	14.2
Social anxiety	21	50.0

Table 3. Distribution of patients according to Age group and sex.

Age group	Sex	Total	%	General health questionnaire		Semi- structured Interview	
				Probable Cases		Cases	
				No	%	No	%
20-29 years	Female=8 Mail=5	13	16.25	4	30.7	4	30.7
30-39 years	F=12 M=7	19	23.75	6	31.5	7	36.8
40-49 ears	F=15 M=11	26	32.5	18	69.2	20	67.9
50-59 years	F=14 M=8	22	27.5	10	45.4	11	50

Table 4. Distribution of patients according to marital status.

Marital status	Total	%	General health questionnaire		Semi- Structured interview	
			Probable cases		Cases	
			No	%	No	%
Single	18	22.5	7	38.8	8	44.4
Married	35	43.75	18	51.4	20	57.1
Divorced	11	13.75	4	36.3	5	45.4
Widowed	13	16.25	8	61.5	8	61.8
Separated	3	3.75	1	33.3	1	33.3

Table 5. Distribution of patients according to marital status.

Job	Total	%	General health questionnaire		Semi- Structured interview	
			Probable cases		Cases	
			No	%	No	%
Employed	18	22.5	8	44.4	9	50
Student	9	11.25	4	44.4	4	44.4
Houswife	28	35	13	46.8	15	53.5
Retired	16	20	8	50	9	56.25
Unemployment	6	11.25	5	55.5	5	55.5

Table 6. Distribution of patients according to duration of illness.

Age	Total	%	General health questionnaire		Semi- Structured interview	
			Probable cases		Cases	
			No	%	No	%
< 1 year	10	12.5	4	40	5	50
1-5 year	14	17.5	6	42.8	6	42.8
6-10 years	12	15	5	41.6	5	41.6
11-15 years	22	27.5	14	63.6	15	68.1
16-20 years	12	15	5	41.6	6	50
> 21 years	10	12.5	4	40	5	50

Table 7. The distribution of patients according to physical complications.

Complication	Male	Female	Total
Nephropathy	3	7	10
Cataract	6	6	12
Ratinopathy	4	3	7
Sexual (impotence)	11	0	11
Neuropathy	5	3	8
Diabetic foot	5	2	7

RESULTS AND DISCUSION

The highest no. of physical complications were present Sexual problem (impotence) and Cataract in male; in the female nephropathy and. cataract were the higher physical complication present. This study of psychiatric morbidity of diabetes mellitus patients disorder consist of both types), of dibetec mellitus, other thesis [1]. The result of the present study revealed that the prevalence of [12] ADD about 52.5% of diabetic patients attending the diabetic clinics in sample. These numbers are higher when compared with other studies from other countries, 18%. Table 1. Also another study using the same technique, the prevalence of psychiatric morbidity among diabetic inpatients that complain from other medical diseases was 23% [15], and 39% in diabetic inpatients with nearological disorder [5]. we compare the study with other studies derived from developed countries; the psychiatric morbidity crated by those health problems might be higher In developing countries due to low level of health education about diabetes, also the high rate due the limitations of the study, increased prevalence of psychiatric morbidity explain as due to different stressful and fearful security and environmental circumstances. The psychiatric morbidity was mainly depression 30%, anxiety 22.5%. This was relevant to another study conducted in Iraq which represented the depression rate36% [12]. Also another study of diabetic patients found that depression and anxiety were the commonest diagnosis; and the cases diagnosed as depression twice than that of the anxiety [17]. So when we compare the result from the present study with other studies we found that there were similarities in the results. Diabetic patients with psychiatric morbidity are mainly in middle age group" between" 40-49 year old in the present study The highest ((no 11 of patient's with Anxiety .depression disorders present as, AD(50.0) then followed by generalized anxiety disorder, also equal number for Phobia (agoraphobia) and MDD (14.2%). Table 2. In community study; psychiatric morbidity had their peak occurrence between 25-44 years old in diabetic patients [18]. Also another study obtained the highest psychiatric morbidity in age group range from 25-34years [1]. So when we compare the result from the present study with other studies we found there were similarities in result. The psychiatric morbidity was more in women than men this may be due to the higher number of female compared to male in the sample and in Iraqi society, also may be due to high levels of stressful

condition compress the female related to cultural and social background in developing countries Table 3 . Also the psychiatric morbidity more in widowed than otiier patients, this may be due to lack of family support as a result of lost his wife Table 4. The depression and anxiety are more in single patients compare to the married, which is significant, this IS also may be due to lack of family support compared to the married patients, Table 4. Psychiatric morbidity is more in the unemployed and retired than others, between (50%-55.5%), depression more in unemployed, housewife and retired patient, Anxiety is more in students in the present study Table 5. Another study: the psychiatric morbidity was more in unemplGyed patiente. ([1]) So when we compare result from the present study with another study found there were similarities in result. The present study oblained about (45.2%) of psychiatric cases have physical complications Table 6, 7. The physical complications in diabetic patients about (40%) obtained from another study [1]. So when we compare result from the present study with another study found there were similarities in result.

CONCLUSIONS

The present study conclude that the prevalence of ADD morbidity is about 52.5% among diabetic patients attending to diabetes mellitus clinics. The psychiatric morbidity was mainly depression 30% and anxiety 22^%; also psychiatric morbidity was mainly in middle age group between 40-49 year old, about 45 J% of psychiatric cases have' physical complications that lead to increase the prevalence of ADD morbidity in the present study. The prevalence of ADD morbidity in Diabetic mellitus patients' needs more studies especially in Iraq as there has been little attention being paid to this subject. The prevalence of ADD in Diabetes mellitus patient's needs studies using other methodologies in research like case-control studies to minimize as much as possible the bias in studies.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: In this research, all experimental protocols were approved under the Department of Pediatric & 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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Linum usitatissimum: Anti-bacterial Activity, Chromatography, Bioactive Compounds, Applications: A Review

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ABSTRACT

Flax is a food and fiber crop cultivated in cooler regions of the world. The flowers are pure pale blue, 15–25 mm in diameter, with five petals. The fruit is a round, dry capsule 5–9 mm in diameter, containing several glossy brown seeds shaped like an apple pip, 4–7 mm long. Flax is grown for its oil, used as a nutritional supplement, and as an ingredient in many wood-finishing products. Flax is also grown as an ornamental plant in gardens. Flax fibers are used to make linen. The Latin species name usitatissimum means "most useful. The oil is applied externally to treat joint and muscle pains, non-healing wounds, skin disorders. Flaxseed oil also helps in speeding up the healing of skin lesions and has proved very effective for everything acne, psoriasis, eczema, and sunburn. Omega-3 fatty acids offer protection against heart disease by getting to the membrane of body cells and acting as guards that admit only healthy substances and bar damaging ones.

Keyword: *Biological action, Linum usitatissimum, Review, Chromatography, Bioactive compounds, Applications.*

INTRODUCTION

The textiles made from flax are known in the Western countries as linen, and traditionally used for bed sheets, underclothes, and table linen. The oil is known as linseed oil. The plant species is known only as a cultivated plant, and appears to have been domesticated just once from the wild species Linum bienne, called pale flax. Cultivated flax plants grow to 1.2 m (3 ft 11 in) tall, with slender stems [1-13]. The leaves are glaucous green, slender lanceolate, 20–40 mm long, and 3 mm broad. Several other species in the genus Linum are similar in appearance to L. usitatissimum, cultivated flax, including some that have similar blue flowers, and others with white, yellow, or red flowers. Some of these are perennial plants, unlike L. usitatissimum, which is an annual plant. Flax fibers are taken from the stem of the plant, and are two to three times as strong as those of cotton. Additionally, flax fibers are naturally smooth and straight. Europe and North America depended on flax for vegetable-based cloth until the 19th century, when cotton overtook flax as the most common plant used for making rag-based paper. Flaxseed and its oil have repeatedly been demonstrated to be nontoxic and are generally recognized as safe for human consumption [14-27]. Flax, like many common foods, contains small amounts of cyanogenic glycoside; these are nontoxic when consumed in typical amounts, but may be toxic in large quantities from consuming staple foods such as cassava. Typical concentrations (for example, 0.48% in a sample of defatted dehusked flaxseed meal) can be removed by special processing.

Biological action

Inflammation

The effect of *L. usitatissimum* fixed oil on distinct phases of the inflammatory process: first, an acute phase of local vasodilatationand increased capillary permeability leading toexudation, followed by leucocytes migration [28-32].

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Hepato-protective

Flaxseed oil is the richsources of omega 3-fatty acids and is so potent antioxidants. Raw and baked flaxseed productsinduce hypolipidemic, hypoglycemic and hypocholesterolaemia effects which may beattributed mainly to seed oil rich in alpha linolenic acid.

External Application

Linseed pastes local application is useful in healing wounds and abscesses faster. It promotes the health of hair and nails and has substances called lignans, which have a beneficial effect on the hormonal system of the body [33].

Brain health and ADHD

The essential fatty acids present in flaxseed helps in the transmission of nervous impulses. This makes flaxseed oil very useful for numbness and tingling as well as for preventing serious nerve ailments like Parkinson' sand Alzheimer's disease. It is very useful in treating intelligence related disorders such as ADHD. Bipolar disorder, depression, menopausal symptoms.

Hormone supplement

One important benefit is that flaxseed contains phytoestrogens that canmimic the human sex hormone estrogen. It is use fulf or infertility, impotence, menstrual cramps, endometriosis and menopausal problems.

Cardio-protective

It is used in the treatment of cardiac disorders and cholesterol. It acts as a blood thinning agent. Hence, it is useful in preventing andtreating atherosclerosis (cholesterol and clotdevelopment in blood pipes of the heart).

Pharmacological activities

Anti-inflammatory activity

Some studies investigated the effect of fixed oil present in flaxseed on distinct phases of inflammation. *L. usitatissimum* fixed oil demonstrated a significant dose-dependent inhibition of protein exudation (i.e., the rise in protein concentration in peritoneal fluid) and inhibited the vascular permeability shown by inhibition to dye leakage.

Anti-estrogenic activity

Some studies investigated that potential phytoestrogens isolated from flaxseed significantly stimulate estrogen production in MCF7 breast cancer cells. They also observed a down-regulation of ERβ receptor expression and down-regulation of PR expression in MCF7 cells after treatment.

Anti-ulcerogenic action

Some studies investigated the effect of mucilage and fixed oil on the gastric lesions induced by ethanol. Their study provides clear evidence that consumption of the products of flaxseed (oil and mucilage) have gastro-protective effect against ethanol-induced gastric ulcers.

Anti-bacterial activity

Studies investigated the effect of flaxseed proteins on the several species of gram positive and gram negative bacteria.

CONCLUSION

Medicinal property of *Linum usitatissimum* is due to presence of secondary metabolites. *Linum usitatissimum*, is widely used in the treatment of treatment of cardiac disorders and cholesterol, anti-inflammatory activity and anti-ulcerogenic action.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: In our review, all these major pharmacological activity were complete analysis under the biological department of College of Science for Women in Hillah city.

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Characterization of Antibacterial and Antifungal Metabolites Produced by *Macrophomia phaseolus* and Analysis of Its Chemical Compounds Using GC-MS

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ABSTRACT

Twenty one bioactive compounds were identified in the methanolic extract of Macrophomia phaseolus. GC-MS analysis of Macrophomia phaseolus revealed the existence of the Benzonitrile , m-phenethyl, Carbamic acid, N,N-dimethyl-,3,4-dimethylphenyl ester, 3-Cyano-6-oxopyrazolo[3,4-d]pyrimidin-4-thione, 4H-Benz[b]1,4-oxazin-2(3H)-one, 7-nitro-3-(2-oxo-2-phenylethy, 1-Benzenesulfonyl-1H-pyrrole, Pentyl glycolate, Ethyl fluoroformate, Cyclopropyl-3,4-epoxyhex-5-en, Benzimidazole ,7-methyl-, 1,1-Difluoro-cis-2,3-dimethyl-cyclopropane, Pyrazolo[1,5-a]pyridine, 3-methyl-2-phenyl-, N,N-Dimethyl-3-methoxy-4-methylphenethylamine, 1,1'-Bicyclohexyl , 4-methoxy-4'-propyl-, 1-benzylindole, and Benzenemethanol ,2-chloro-α-[[(1-methylethyl)amino) methyl. Datura stramonium (Alkaloids) was very highly active 6.61±0.26 mm. The results of anti-fungal and anti-bacterial activity produced by Macrophomia phaseolus showed that the volatile compounds were highly effective to suppress the growth of Aspergillus flavus 6.009±0.23mm and Proteus mirabilis 6.38±0.22mm.

Keywords: Antifungal, Antibacterial, Macrophomia phaseolus, GC-MS, Secondary metabolites.

INTRODUCTION

Macrophomina phaseolina is a Botryosphaeriaceae plant pathogen fungus that causes damping off, seedling blight, collar rot, stem rot, charcoal rot, basal stem rot, and root rot on many plant species[1-5]. The *M. phaseolina* fungus has aggregates of hyphal cells, which form microsclerotia within the taproots and stems of the host plants. The pathogen *M. phaseolina* affects the fibrovascular system of the roots and basal internodes of its host, impeding the transport of water and nutrients to the upper parts of the plant. As a result, progressive wilting, premature dying, loss of vigor, and reduced yield are characteristic symptoms of *M. phaseolina* infection.

The fungus also causes many diseases like damping off, seedling blight, collar rot, stem rot, charcoal rot, basal stem rot, and root rot. The hyphae infect the roots of the host plant. Initially, the hyphae enter the cortical tissue and grow intercellularly, then infect the roots and the vascular tissue. Within the vascular tissue, mycelia and sclerotia are produced and plug the vessels [6-11]. *M. phaseolina* is a heat- and drought-favoring disease, producing large quantities of microsclerotia under relatively low water potentials and relatively high temperatures. In soybeans especially, charcoal rot typically occurs when the plants are experiencing significant drought stress [12, 13]. The aims of this study were analysis of the metabolite products and determination antimicrobial activity.

MATERIALS AND METHOD

Analysis of bioactive compounds

GC-MS analysis was done on a thermo gas chromatography mass spectrometer (Agilent 789 A) equipped with DB-5 capillary column (30 m long,

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0.25 mm i.d., film thickness 0.25 μm). The column temperature program was 50 °C for 6 min, with 5 °C increases per min to 250 °C; which was maintained for 30 min. *Macrophomia phaseolus* was isolated from dried fruit and the pure colonies were selected, isolated and maintained in potato dextrose agar slants [14-19]. Spores were grown in a liquid culture of potato dextrose broth (PDB) and incubated at 25ºC in a shaker for sixteen days at 150 rpm. The extraction was performed by adding 50 ml methanol to 150 ml liquid culture in an Erlenmeyer flask after the infiltration of the culture. 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 [20, 21]. 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 GC-MS.

Determination of antibacterial and antifungal activity

The test pathogens were swabbed in Muller Hinton agar plates. 90μl of fungal extracts was loaded on the bored wells. The wells were bored in 0.5cm in diameter. The plates were incubated at 37C° for 24 hr and examined [22-28]. After the incubation the diameter of inhibition zones around the discs was measured. *Macrophomia phaseolus* isolate was suspended in potato dextrose broth and diluted to approximately 105 colony forming unit (CFU) per ml. They were "flood inoculated onto the surface of Potato dextrose agar and then dried. Standard agar well diffusion method was followed [29-33]. 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. Methanol was used as solvent control [34-38].

Table 1. Bioactive chemical compounds identified in methanolic extract of *Macrophomia phaseolus*.

Benzonitrile , m-phenethyl- RT=3.156 Mw=207.104799 **Pharmacological activity:** Unknown	Carbamic acid , N,N-dimethyl-,3,4-dimethylphenyl ester RT= 3.161 Mw= 193.110279 **Pharmacological activity:** anti-oxidative potential	3-Cyano-6-oxopyrazolo[3,4-d]pyrimidin-4-thione RT= 3.264 Mw= 193.005831 **Pharmacological activity:** antifungal activity
4H-Benz[b]1,4-oxazin-2(3H)-one , 7-nitro-3-(2-oxo-2-phenylethy RT= 3.819 Mw= 310.058971 **Pharmacological activity:** Unknown	1-Benzenesulfonyl-1H-pyrrole RT= 4.014 Mw= 207.035399 **Pharmacological activity:** antimicrobial activity	Pentyl glycolate RT= 4.077 Mw= 146.094295 **Pharmacological activity:** anti-fungal activity
Ethyl fluoroformate RT= 4.237 Mw= 92.0273576 **Pharmacologicalactivity:** anti-inflammatory activity	1-Cyclopropyl-3,4-epoxyhex-5-en-1-yne RT= 4.226 Mw= 134.073165 **Pharmacological activity:** anti-.inflammatory, anticancer	Benzimidazole ,7-methyl-2-phenyl- RT= 4.460 Mw= 208.100048 **Pharmacological activity:** antimicrobial, antiviral
1,1-Difluoro-cis-2,3-dimethyl-cyclopropane RT= 4.397 Mw= 106.0594068 **Pharmacological activity:** Unknown	Pyrazolo[1,5-a]pyridine , 3-methyl-2-phenyl- RT= 4.649 Mw= 208.100048 **Pharmacological activity:** Unknown	L-Proline , N-(cyclohexanecarbonyl)-,propyl ester RT= 4.992 Mw= 267.183443 **Pharmacological activity:** Unknown

***Cont...* Table 1. Bioactive chemical compounds identified in methanolic extract of *Macrophomia phaseolus*.**

N,N-Dimethyl-3-methoxy-4-methylphenethylamine **RT**= 5.622 **Mw**= 193.146665 **Pharmacological activity:** anti-inflammatory activity	1,1'-Bicyclohexyl , 4-methoxy-4'-propyl- **RT**= 7.235 **Mw**= 238.229666 **Pharmacological activity:** anti-.inflammatory, anticancer	1-benzylindole **RT**= 7.882 **Mw**= 207.104799 **Pharmacological activity:** anti-inflammatory
3-Amino-7-nitro-1,2-benzotriazine 1-oxide **RT**= 8.986 **Mw**= 207.039239 **Pharmacological activity:** antiviral, anticancer, anti-inflammatory	Benzenemethanol ,2-chloro-α-[[(1-methylethyl)amino) methyl]- **RT**= 9.850 **Mw**= 213.092042 **Pharmacological activity:** Unknown	Isoindole-1,3(2H)-dione-4,7-ethano-3a,4,7,7a-tetrahydro-2- **RT**= 10.365 **Mw**= 253.110279 **Pharmacological activity:** anti-inflammatory

Table 2. Zone of inhibition (mm) of test different bioactive compounds and standard antibiotics of medicinal plants to *Macrophomia phaseolus*.

S. No.	Plant	Zone of inhibition (mm)
1.	*Ricinus communis* (Alkaloids)	2.99±0.19
2.	*Datura stramonium*(Alkaloids)	6.61±0.26
3.	*Linum usitatissimum* (Crude)	4.97±0.23
4.	*Anastatica hierochuntica* (Crude)	5.98±0.22
5.	*Cassia angustifolia* (Crude)	5.51±0.24
6.	*Euphorbia lathyrus* (Crude)	6.00±0.25
7.	*Rosmarinus oficinalis* (Crude)	5.54±0.23
8.	*Citrullus colocynthis* (Crude)	4.10±0.17
9.	*Althaea rosea* (Crude)	5.71±0.20
10.	*Coriandrum sativum* (Crude)	3.42±0.21
11.	*Origanum vulgare* (Crude)	5.63±0.25
12.	*Urtica dioica* (Crude)	3.98±0.21
13.	*Foeniculum vulgare* (Crude)	2.94±0.19
14.	*Ocimum basilicum* (Crude)	5.03±0.23
15.	Control	0.00

RESULTS AND DISCUSSION

Microscopical characteristics of fungal strains were determined using specific media light and compound microscope. Gas chromatography and mass spectroscopy analysis of compounds was carried out in methanolic extract of Macrophomia phaseolus, shown in Table 1. Many compounds are identified in the present study. Some of them are biological compounds with antimicrobial activities. Clinical pathogens selected for antibacterial activity namely, Escherichia coli, Bacillus subtilis, Pseudomonas eurogenosa, Streptococcus pyogenes, Staphylococcus epidermidis, Proteus mirabilis, Klebsiella pneumonia and Staphylococcus aureus, maximum zone formation against Proteus mirabilis 6.38±0.22 mm. Methanolic extraction of Macrophomia phaseolus showed notable antifungal activities against Saccharomyces cerevisiae, M. canis,

Trichoderma viride, Aspergillus flavus, Aspergillus fumigatus, Penicillium expansum, Aspergillus terreus and Candida albicans. Aspergillus flavus was very highly active against Macrophomia phaseolus 6.009±0.23. In agar well diffusion method the selected medicinal plants were effective against Macrophomia phaseolus Table 2. Five-millimeter diameter wells were cut from the agar and 20 μl of the samples solutions Ricinus communis (Alkaloids), Datura stramonium(Alkaloids), Linum usitatissimum (Crude), Anastatica hierochuntica (Crude), Cassia angustifolia   (Crude), Euphorbia lathyrus   (Crude), Rosmarinus oficinalis   (Crude), Citrullus colocynthis (Crude), Althaea rosea (Crude), Coriandrum sativum (Crude), Origanum vulgare (Crude), Urtica dioica (Crude), Foeniculum vulgare (Crude), and Ocimum basilicum (Crude). Datura stramonium (Alkaloids) was very highly active 6.61±0.26 mm against Macrophomia phaseolus. Macrophomia phaseolus 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 [39-44]. Recently, it was demonstrated that volatile organic compounds (VOCs) of bacteria such as terpenoids, phenylpropanoids and fatty acid [45-50] derivatives can influence the growth of some fungi and, in general, the inter- and intra-organismic communication signals.

CONCLUSION

Macrophomia phaseolus produce many important secondary metabolites with high biological activities. Macrophomia phaseolus 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.

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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In Vitro Anti-diabetic Properties of Methanolic Extract of *Thymus vulgaris* Using α-glucosidase and α-amylase Inhibition Assay and Determination of its Bioactive Chemical Compounds

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ABSTRACT

The objectives of our research were analysis of the bioactive chemical metabolite products and determination *In vitro* anti-diabetic properties. The results of anti-diabetic activity produced by *Thymus vulgaris* showed that the volatile compounds were effective to α-glucosidase and α-amylase inhibition. The purification of compounds produced by *Thymus vulgaris* can be useful. Twenty seven bioactive compounds were identified in the methanolic extract of *Thymus vulgaris*. Gas chromatography – mass spectrum analysis analysis of *Thymus vulgaris* revealed the existence of the Erythritol , γ-Terpinene, Octan-2-one , 3,6-dimethyl- , DL-Leucine, N-glycyl-, Trans-2-Caren-4-ol , Dithiocarbamate , S-methyl-,N-(2-methyl-3-oxobutyl)- , 5-Caranol, trans, trans-(+)- , Phenol,2-methyl-5-(1-methylethyl)- , Phenol,2-methyl-5-(1-methylethyl)-, acetate , (5β)Pregnane-3,20β-diol, 14α,18α-[4-methyl-3-oxo(1-oxa-4-, β-Bisabolene , 1-Chloro-1-n-decyloxy-1-silacyclopentane, 7-epi-trans-sesquisabinene hydrate , (-)-Spathulenol , Caryophyllene oxide, 1-Heptatriacotanol , Ppropiolic acid , 3-(1-hydroxy-2-isopropyl-5-methylcyclohexyl)- , Naphthalene,1,2,3,4,4a,5,6,7-octahydro-4a-methyl-, Paromomycin, Gibberellic acid, Phytol , 2,7-Diphenyl-1,6-dioxopyridazino[4,5:2',3']pyrrolo[4',5'-d] pyrida, Androst-4,6-dien-3,11,17-trione, 9-mercapto- , Ricinoleic acid , 4a,10a-Methanophenenthren-9β-ol, 11-syn-bromo-1,2,3,4,4a and (+)-γ- Tocopherol , O-methyl.

Keywords: *Thymus vulgaris, Anti-diabetic, α-amylase, GC-MS, α-glucosidase, Secondary metabolites.*

INTRODUCTION

Thyme is one of flowering plant in the family of Lamiaceae, native to southern Europe and western Mediterranean [1, 2]. Growing to fifteen to thirteen cm (6–12 in) tall by forty cm (16 in) wide, it is a bushy, and clusters of purple or pink flowers in early summer. P-cymene, myrcene, borneol, and linalool are Thyme essential oil. Many compounds in the composition of the bioactive chemical compounds (essential oil) are antioxidants that act in secondary products response and other oxidant species. These responses are promoted by toxins produced by pathogenic bacteria and fungi. The British Herbal Pharmacopoeia classifies these species as a bioactive medicinal plants for its use it mentions bronchial catarrh, bronchitis, sore throats, and whooping cough [3-6]. Diabetes mellitus is a disorder that affects the metabolism of protein, carbohydrate, and fat. Diabetes are in three forms. Type 1, type 2, and gestational diabetes are the three main types of diabetes. α-glucosidase are responsible for the analysis of oligo- and/or disaccharides to monosaccharides. Therefore these enzymes leads to a decrease the level of blood glucose, because the form of carbohydrates (monosaccharides) are absorbed through the mucosal border in the small intestine [7-10]. α-amylase enzyme which is dependable for the collapse of starch to more

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uncomplicated sugars (glucose , maltose maltotriose and dextrin). Acarbose are inhibitors or controller currently in clinical use and miglitol which inhibit glycosidases such as α-glucosidase and α-amylase [11, 12]. The aims of our study were evaluation *In vitro* anti-diabetic properties and screening bioactive chemical products of *Thymus vulgaris*.

MATERIAL AND METHOD

Gas chromatography – Mass Spectrum analysis

Thymus vulgaris Gas chromatography – Mass Spectrum analysis were follow out in a Gas chromatography 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. Performance of data of mass spectrum was conducted NIST, USA. The database consists of more than 62,000 patterns of known compounds [13-16]. The spectrum of the extract was matched with the spectrum of the known components stored in the NIST library.

In Vitro α-glucosidase Inhibition Assay

1 mg of α-glucosidase was melt in one hundred ml of phosphate buffer (pH 6.8).

Two hundred μl α-glucosidase were added to one hundred μl of (2, 4, 8, 10, 15 μg/ml) sample extracts then the mixture was incubated at 37ºC for 20 min [17-19]. Then one hundred μl 3mM *p*-nitrophenyl α-D-glucopyranoside (p-NPG) was added to the mixture and incubated at 37 ºC for 10 min. By the addition of 2ml Na2CO3 0.1M The reaction was terminated and the α-glucosidase efficiency was fixed spectro-photometrically at 405 nm on spectro-photometer UV-VIS.

In Vitro α-amylase Inhibition Assay

Two hundred μl porcine pancreatic amylase was added to one hundred μl of (2, 4, 8, 10, 15 μg/ml) *Thymus vulgaris* extract. Then one hundred μl (1%) starch thaw was added and incubated at 37 ºC for ten min. The reaction watered with 2.2 ml and absorbance was read at 540 nm [20,21]. For each concentration, blank tubes were prepared by replacing the enzyme solution with two hundred μL in distilled water.

Positive monitoring of α-amylase and α-glucosidase inhibitor

Positive control of α-glucosidase inhibitor and α-amylase was Acarbose [22-24]. Inhibit 50% of α-glucosidase and α-amylase activity under the examination conditions was defined as the IC50 value. Percentage inhibition (I %) was studied by:

I % = (Ac-As)/Ac X 100

As is the absorbance of the sample and Ac is the absorbance of the control.

Table 1: Bioactive compounds detected in *Thymus vulgaris* extract.

Serial No.	Phytochemical compound	RT (min)	Molecular Weight	Exact Mass
1.	Erythritol	3.430	122	122.057909
2.	γ-Terpinene	4.500	136	136.1252
3.	Octan-2-one , 3,6-dimethyl-	5.009	156	156.151415
4.	DL-Leucine , N-glycyl-	5.112	188	188.116093
5.	Trans-2-Caren-4-ol	5.318	152	152.120115
6.	Cis-p-Mentha-2,8-dien-1-ol	5.484	152	152.120115
7.	Dithiocarbamate , S-methyl-,N-(2-methyl-3-oxobutyl)-	5.656	191	191.043856
8.	5-Caranol , trans , trans-(+)-	5.833	154	154.135765
9.	Phenol,2-methyl-5-(1-methylethyl)-	6.297	150	150.1044655

***Cont...* Table 1: Bioactive compounds detected in *Thymus vulgaris* extract.**

10.	Phenol ,2-methyl-5-(1-methylethyl)-, acetate	7.567	192	192.115029
11.	(5β)Pregnane-3,20β-diol , 14α,18α-[4-methyl-3-oxo(1-oxa-4-	8.540	489	489.309038
12.	β-Bisabolene	8.992	204	204.1878
13.	1-Chloro-1-n-decyloxy-1-silacyclopentane	9.204	276	276.16762
14.	7-epi-trans-sesquisabinene hydrate	9.335	222	222.198365
15.	(-)-Spathulenol	9.867	220	220.182715
16.	Caryophyllene oxide	9.942	220	220.182715
17.	1-Heptatriacotanol	10.348	536	536.58962
18.	Ppropiolic acid , 3-(1-hydroxy-2-isopropyl-5-methylcyclohexyl)-	11.979	224	224.141245
19.	Naphthalene ,1,2,3,4,4a,5,6,7-octahydro-4a-methyl-	13.386	150	150.140851
20.	Paromomycin	12.448	615	615.296303
21.	Gibberellic acid	14.302	346	346.141638
22.	Phytol	15.029	296	296.307917
23.	2,7-Diphenyl-1,6-dioxopyridazino[4,5:2',3']pyrrolo[4',5'-d]pyrida	15.183	355	355.106924
24.	Androst-4,6-dien-3,11,17-trione , 9-mercapto-	15.990	330	330.128965
25.	Ricinoleic acid	16.985	298	298.250795
26.	4a,10a-Methanophenenthren-9β-ol , 11-syn-bromo-1,2,3,4,4a	18.931	292	292.046276
27.	(+)-γ- Tocopherol , O-methyl-	22.793	430	430.38108

RESULTS AND DISCUSSION

Identification of biochemical compounds

Analysis of component was done in extract of *Thymus vulgaris*, shown in **Table 1.** Chromatogram gas chromatography – mass spectrum analysis of *Thymus vulgaris* extract showed the presence of twenty seven major peaks were determined as follows. All peaks were determined to be Erythritol , γ-Terpinene , Octan-2-one , 3,6-dimethyl- , DL-Leucine , N-glycyl- , Trans-2-Caren-4-ol , Dithiocarbamate , S-methyl-,N-(2-methyl-3-oxobutyl)- , 5-Caranol , trans , trans-(+)- , Phenol,2-methyl-5-(1-methylethyl)- , Phenol ,2-methyl-5-(1-methylethyl)-, acetate , (5β)Pregnane-3,20β-diol , 14α,18α-[4-methyl-3-oxo(1-oxa-4- , β-Bisabolene , 1-Chloro-1-n-decyloxy-1-silacyclopentane , 7-epi-trans-sesquisabinene hydrate , (-)-Spathulenol ,

Caryophyllene oxide , 1-Heptatriacotanol , Ppropiolic acid , 3-(1-hydroxy-2-isopropyl-5-methylcyclohexyl)- , Naphthalene ,1,2,3,4,4a,5,6,7-octahydro-4a-methyl- , Paromomycin , Gibberellic acid , Phytol , 2,7-Diphenyl-1,6-dioxopyridazino[4,5:2',3']pyrrolo[4',5'-d]pyrida , Androst-4,6-dien-3,11,17-trione , 9-mercapto- , Ricinoleic acid , 4a,10a-Methanophenenthren-9β-ol , 11-syn-bromo-1,2,3,4,4a and (+)-γ- Tocopherol , O-methyl.

In *vitro* α-glucosidase inhibition assay

Methanol, ethanol and aqueous extract of *Thymus vulgaris* showed notable anti-diabetic activities. Secondary metabolite of methanolic extract of *Thymus vulgaris* was active In *vitro* α-glucosidase inhibition. α-glucosidase inhibition had been distributed according to alcoholic extract of *Thymus vulgaris* (Methanol,

ethanol and aqueous) in different concentrations (Con. 4 µg/ml, 8 µg/ml, 15 µg/ml, 20 µg/ml, and 15 µg/ml) were (4.35, 22.04, 30.77, 43.13 and 51.08) respectively in methanolic extract, and (4.03, 19.12, 27.89, 39.12 and 46.58) respectively in ethanolic extract, and (3.51, 18.37, 25.71, 36.94 and 44.31) respectively in aqueous extract, and (16.11, 44.16, 53.02, 63.70 and 70.21) respectively in Acarbose, as a control.

In *vitro* α-Amylase inhibition method

Secondary metabolite of methanol, ethanol and aqueous extract of *Thymus vulgaris* were used for test of anti-diabetic activities in different concentrations (Con. 4 µg/ml, 8 µg/ml, 15 µg/ml, 20 µg/ml, and 15 µg/ml). α-amylase inhibition recorded (6.39, 11.47, 17.01, 22.93 and 24.07) respectively in methanolic extract, and (5.97, 10.02, 16.05, 21.27 and 23.05) respectively in ethanolic extract, and (4.94, 9.88, 15.69, 20.44 and 22.63) respectively in aqueous extract, and (12.37, 25.16, 36.08, 44.97 and 56.13) respectively in Acarbose, as a control.

CONCLUSION

Twenty seven bioactive chemical compounds have been detected from *Thymus vulgaris* extract by gas chromatogram mass spectrometry (GC-MS). *In vitro* antifungal and antibacterial evaluation of secondary metabolite products of *Thymus vulgaris* forms a primary platform for further phyto-chemical and pharmacological evaluation for the expansion of new useful antimicrobial compounds.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: In our research, all protocols were approved under the Department of Biology, College of Science for women, University of Babylon, Hillah city, Iraq and all methods were carried out in accordance with approved guidelines.

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Antimicrobial, Anti-inflammatory, Analgesic Potential and Cytotoxic Activity of *Salvadora persica* : A Review

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ABSTRACT

Salvadora persica is a popular teeth cleaning stick throughout the Arabian Peninsula, as well as the wider Muslim world. Also commonly referred to as miswak. *S. persica* exhibited significant antimicrobial activity against both aerobic as well as anaerobic bacteria collected from teeth by different researchers in the various parts of world. Dental plaque is a general term used for the diverse microbial community (predominantly bacteria) found on the tooth surface, embedded in a matrix of polymers of bacterial and salivary origin. Plaque develops naturally on teeth, and forms part of the defense systems of the host by helping to prevent colonization of enamel by exogenous (and often pathogenic) microorganisms (colonization resistance). *S. persica* is found to be a multipurpose plant and possesses several agro-pharmaceutical applications. Toothbrushes prepared from the roots and small branches of *S. persica*, to be highly useful as maintainer of teeth. Plant possess anti-microbial, anti-plaque, aphrodisiac, alexiteric, analgesic, anti-inflammatory, anti-pyretic, astringent, diuretic and bitter stomachic activities. It has great medicinal use in the treatment of nose troubles, piles, scabies, leucoderma, scurvy, gonorrhea, boils and toothache, to treat hook worm, venereal diseases, for teeth cleaning, in rheumatism, cough and asthma, to lower cholesterol plasma levels, reestablishment of the components of gastric mucosa, and as a laxative.

Keyword: *Salvadora persica, A review, Antimicrobial, Anti-inflammatory, analgesic, Cytotoxic.*

INTRODUCTION

Meswak (*Salvadora persica*) is one of the most commonly used medicinal plants for oral hygiene among global Muslim community. *Salvadora persica* has antiurolithiatic properties. Used for centuries as a natural toothbrush, its fibrous branches have been promoted by the World Health Organization for oral hygiene use. Research suggests that it contains a number of medically beneficial properties including abrasives, antiseptics, astringent, detergents, enzyme inhibitors, and fluoride [1-17]. Previous studies have reported that S. persica extracts were effective against *Streptococcus mutans* and *Streptococcus faecalis*, even using low extract concentrations. Plaque is found preferentially at protected and stagnant surfaces, and these are at the greatest risk of disease. Moreover, the attachment, growth, removal and reattachment of bacteria to the tooth surface[18-23] are a continuous and dynamic process. Dental plaque, biofilms of microorganisms on tooth surface, plays an important role in the development of caries and periodontal disease.

Antimicrobial activities

According to both antimicrobial assays, the aqueous extract inhibited all isolated microorganisms, especially the *Streptococcus* spp., and was more efficient than the methanol extract, which was resisted by *L. acidophilus* and *P. aeruginosa*. In vitro antibacterial effect of miswak pieces without extraction has been[19-29] found most pronounced on *P. gingivalis*, *A. actinomycetemcomitans*, and *H. influenzae*, less on Strep. mutans, and least on

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L. acidophilus. The antibacterial effect of suspended miswak pieces suggested the presence of volatile active antibacterial compounds.

Cytotoxic activity

Both *persica* and CHX mouthwashes were toxic to macrophage, epithelial, fibroblast, and osteoblast cells in a concentration-dependent manner.

Tick-repellent properties

The S. persica, Pistacia, and Juniperus phoenicea were evaluated using host-seeking nymphs of Ixodes ricinus in the laboratory for tick-repellent effects of the essential oils[30-45]. Significant tick-repellent effects were observed for the oils of all three species, but the duration of action was short.

Anti-inflammatory and analgesic potential

The extract of stem of *S. persica* was reported to possess anti-inflammatory activity.

ACE-inhibiting ability

In vitro screening has reported that *S. persica* possesses high ACE-inhibiting ability.

Anticonvulsant and sedative potential

The extracts of *S. persica* extended sleeping time and decreased induction time induced by sodium pentobarbital; in addition it showed protection against pentylenetetrazol-induced convulsion by increasing the latency period and diminishing the death rate[46-51].

Removal of smear layer and occlusion

S. persica contains potential antimicrobial anionic components, and the capillary electrophoresis is a convenient method for their identification and quantification[52-69].

CONCLUSION

S. persica, is widely used in the antimicrobial, cytotoxic activity, anti-inflammatory and analgesic potential. Medicinal plant property of *S. persica* is due to presence of natural bioactive compounds.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: In our review, all these major pharmacological activity were complete analysis under the biological department of College of Science for Women in Hillah city.

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Screening of Metabolites Products of *Fusarium oxysporum* and Determination of Its Antibacterial and Antifungal Activity Using Medicinal Plants Extract

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ABSTRACT

The aims of this study were screening of the secondary metabolite products and evaluation antimicrobial activity. Bioactives are chemical compounds often referred to as secondary metabolites. Twenty one bioactive compounds were identified in the methanolic extract of *Fusarium oxysporum*. The identification of bioactive chemical compounds is based on the peak area, retention time molecular weight and molecular formula. *Melissa officinalis* was very highly active 6.470±0.25 mm. The results of anti-fungal and anti-bacterial activity produced by *Fusarium oxysporum* showed that the volatile compounds were highly effective to suppress the growth of *Aspergillus fumigatus* (5.893±0.20) and *Streptococcus pyogenes* (6.001±0.19). 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 *Fusarium oxysporum* can be useful.

Keywords: *Antifungal, Antibacterial, Fusarium oxysporum, GC-MS, Secondary metabolites.*

INTRODUCTION

Fusarium oxysporum is a common inhabitant of soil and produces three types of asexual spores; macroconidia, microconidia and chlamydospores. Infection by *Fusarium oxysporum* f.sp. cubense triggers the self-defense mechanisms of the host plant causing the secretion of a gel. This is followed by the formation of tylose in the vascular vessels which blocks the movement of water and nutrients to the upper parts of the plant[1-5]. The tips of the feeder roots are the initial sites of infection which then moves on to the rhizome. The leaves begin to wilt and may buckle at the base of the petiole. As the disease progresses, younger leaves are affected, turn yellow and crumple and the whole canopy begins to consist of dead or dying leaves. *F. oxysporum* is primarily spread over short distances by irrigation water and contaminated farm equipment[6-14].

The fungus can also be spread over long distances either in infected transplants or in soil. Although the fungus can sometimes infect the fruit and contaminate its seed, the spread of the fungus by way of the seed is very rare. It is also possible that the spores are spread by wind. *Fusarium oxysporum* is an asexual fungus that produces three types of spores: microconidia, macroconidia, and chlamydospores[14-27]. Microconidia are one or two celled, are produced by *Fusarium oxysporum* under all conditions, and produced the most within the infected plants. The objectives of this study were analysis of the secondary metabolite products and determination of antimicrobial activity.

MATERIALS AND METHOD

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. *Fusarium oxysporum* was isolated and maintained in potato dextrose agar slants. Spores were grown in a liquid culture of potato dextrose broth (PDB) and incubated

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at 25ºC in a shaker for sixteen days at 150 rpm. The extraction was performed by adding 50 ml methanol to 150 ml liquid culture in an Erlenmeyer flask after the infiltration of the culture[28-35]. 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 GC-MS.

Determination of antibacterial and antifungal activity

The test bacterial pathogens were swabbed in Muller Hinton agar plates. 90μl of fungal extracts was loaded on the bored wells. The wells were bored in 0.5cm in diameter. The plates were incubated at 37C° for 24 hr and examined. After the incubation the diameter of inhibition zones around the discs was measured. *Fusarium oxysporum* isolate was suspended in potato dextrose broth. They were "flood inoculated onto the surface of Potato dextrose agar and then dried. Standard agar well diffusion method was followed. 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. Methanol was used as solvent control. Amphotericin B and fluconazole were used as reference antifungal agent[36-47]. The tests were carried out in triplicate. The antifungal activity was evaluated by measuring the inhibition-zone diameter observed after 48 h of incubation. 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.

Table 1. Major phytochemical compounds identified in methanolic extract of *Fusarium oxysporum*.

Serial No.	Phytochemical compound	RT (min)	Molecular Weight
1.	1,2,3,4-Cyclopentanetetrol , (1α,2β,3β,4α)-	3.150	134.057909
2.	2-Furanmethanol	3.259	98.0367794
3.	2,4,6-Cycloheptatrien-1-one , 4-methyl-	3.751	120.0575147
4.	Dihydroxyacetone	3.917	90.031694
5.	2,4-Dihydroxy-2,5-dimethyl-3(2H)-furan-3-one	3.968	144.042258
6.	2,3,5-Trioxabicyclo[2.1.0]pentane , 1,4-bis(phenylm	3.779	254.094295
7.	DL-Arabinose	4.134	150.052823
8.	Isosorbide Dinitrate	4.878	236.028066
9.	5- Hydroxymethylfurfural	6.738	126.031694
10.	6-Acetyl-β-d-mannose	6.686	222.073953
11.	L-Glucose	7.756	180.063388
12.	α-D-Glucopyranoside , O-α-D-glucopyranosyl-(1.fw	10.113	504.169035
13.	N-(2,5-Dicyano-3,4-dihydro-2H-pyrrol-2-yl)-acetamide	10.960	176.069811
14.	8-Hydroxy-2,6-dimethylocta-2,6-dienoic acid ,ethyl	11.458	212.141245
15.	2-Acetylamino-3-hydroxy-propionic acid	11.727	147.053158
16.	5H-Cyclohepta-1,4-dioxin , 2,3,4a,6,7,9a-hexahydro	14.308	154.09938
17.	7-Hydroxy-6-methyl-oct-3-enoic acid	14.525	172.109944
18.	trans-2-undecenoic acid	14.662	184.14633
19.	2-Heptanol , 6-methyl-	15.979	130.135765
20.	Dodecane , 1-fluoro-	16.362	188.194029
21.	Ethylene , 1-nitro-2-[3-benzyloxyphenyl]-	16.608	255.089543

Table 2. Zone of inhibition (mm) of test different bioactive compounds and standard antibiotics of medicinal plants to *Fusarium oxysporum*.

Plant	Inhibition (mm)	Plant	Inhibition (mm)
Diplotaxis cespitosa	5.870±0.23	Daucus carota	5.853±0.22
Cassia angustifolia	5.330±0.23	Vitex agnus-castus	5.633±0.24
Euphorbia lathyrus	6.011±0.22	Cressa cretica	6.006±0.25
Rosmarinus oficinalis	5.680±0.24	Citrus sinensis	6.070±0.22
Citrullus colocynthis	4.000±0.17	Ruta graveolens	4.080±0.19
Althaea rosea	5.074±0.20	Thymus vulgaris	6.007±0.25
Coriandrum sativum	6.370±0.25	Passiflora caerulea	5.900±0.23
Origanum vulgare	5.811±0.24	Glycine max	5.767±0.22
Urtica dioica	3.925±0.23	Brassica oleracea	3.908±0.22
Foeniculum vulgare	2.989±0.17	Olea europaea	3.000±0.19
Ocimum basilicum	5.002±0.24	Calendula officinalis	5.087±0.23
Achillea millefolia	5.514±0.27	Taraxacum officinale	2.008±0.20
Medicago sativa	2.982±0.18	Borago officinalis	3.544±0.19
Celosia argentea	3.261±0.21	Sambucus nigra	2.015±0.23
Apium graveolens	4.801±0.23	C. morifolium	5.906±0.19
Brassica rapa	5.973±0.22	*Equisetum arvense*	6.004±0.24
Cichorium endivia	5.610±0.24	*Portulaca oleracea*	6.070±0.24
Anethum graveolens	6.006±0.23	*Malva neglecta*	5.227±0.19
Plantago major	5.002±0.23	*L. angustifolia*	2.006±0.17
Linum usitatissimum	4.075±0.19	*Althaea Officinalis*	5.005±0.18
A. esculentus	5.551±0.24	*Melissa officinalis*	6.470±0.25
Malva sylvestris	4.991±0.23	Control	0.000

RESULTS AND DISCUSSION

Identification of biochemical compounds

Analysis of compounds was carried out in methanolic extract of Fusarium oxysporum, shown in Table 1. Chromatogram GC-MS analysis of the methanol extract of Fusarium oxysporum showed the presence of thirty one major peaks and the components corresponding to the peaks were determined as follows. Clinical pathogens selected for antibacterial activity namely, Staphylococcus aureus, Staphylococcus epidermidis, Bacillus subtilis, Pseudomonas eurogenosa, Escherichia coli, Proteus mirabilis, Streptococcus pyogenes, and Klebsiella pneumonia maximum zone formation against Streptococcus pyogenes (6.001±0.19) mm. Methanolic extraction of Fusarium oxysporum showed notable antifungal activities against M. canis, Penicillium expansum, Aspergillus flavus, Candida albicans, Aspergillus fumigatus, Trichoderma viride, Saccharomyces cerevisiae, and Aspergillus terreus. Aspergillus fumigatus was very highly active against Fusarium oxysporum (5.893±0.20). In agar well diffusion method the selected medicinal plants were effective against Fusarium oxysporum Table 2. Five-millimeter diameter wells were cut from the agar using a sterile cork-borer, and 25 µl of the samples solutions (Anastatica hierochuntica (Crude), Cassia angustifolia (Crude), Euphorbia lathyrus (Crude), Rosmarinus oficinalis (Crude), Citrullus colocynthis (Crude), Althaea rosea (Crude), Coriandrum sativum (Crude), Origanum vulgare (Crude), Urtica dioica (Crude), Foeniculum vulgare (Crude), and Ocimum basilicum (Crude), Achillea millefolia, Medicago sativa, Celosia argentea, Apium graveolens, Brassica rapa, Cichorium

endivia, Anethum graveolens, Plantago major, Linum usitatissimum, A. esculentus, Malva sylvestris, Vitex agnus-castus, Cressa cretica, Citrus sinensis, Ruta graveolens, Thymus vulgaris, Passiflora caerulea, Glycine max, Brassica oleracea, Olea europaea, Taraxacum officinale, Borago officinalis, Sambucus nigra, C. morifolium, Equisetum arvense, Portulaca oleracea, Portulaca oleracea, Malva neglecta, L. angustifolia, Althaea Officinalis, and Melissa officinalis) were delivered into the wells. Melissa officinalis was very highly antifungal activity (6.470±0.25) mm.

CONCLUSION

Twenty one bioactive chemical constituents have been identified from methanolic extract of the *Fusarium oxysporum* by (GC-MS). In vitro antimicrobial determination of products of *Fusarium oxysporum* forms a primary platform for further phytochemical and pharmacological investigation.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Biology, College of Science, Hillah city, Iraq.

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