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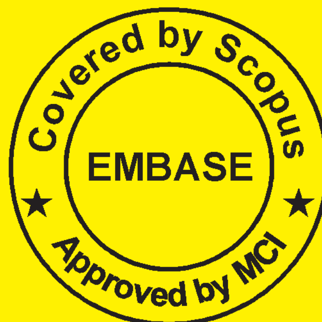

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Correlation between Body Mass Index on Presenteeism and Absenteeism on Dislipidemia Worker

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ABSTRACT

Obesity and Dyslipidemia are the highest health problem at a Fertilizer Company in 2015, Until now the relationship between overweight which measured by body mass index (BMI) and working productivity, in this point is absenteeism, presenteeism have never been assessed. The purpose of this study is to assess the association between the dislipidemic worker's BMI and the reduction of productivity, that is presenteeism, absenteeism. And also to determine the indirect costs due to absenteeism. This study is an observational analytic research using cross sectional type. This study use a questionnaire survey of the World Health Organization (WHO) Health and Performance Qustionnaire (HPQ). Samples were taken from a population of 166 workers by HSE department. With solvin's formula, the number of samples 121 workers. The Result showed significant relationship between body mass index with presenteeism, because the Spearman correlation coefficient showed r = 0.221 and 0.015 Significance values. There is a significant relationship between Body Mass Index (BMI) and Absenteeism, with Spearman correlation coefficient r = 0.227. Significance value is 0.012. Conclusion: The body mass index is highly correlated with workers productivity that are presenteeism and absenteeism, Productivity decreases will affect the indirect costs incurred by the company, especially their absenteeism.

Keywords; *Dyslipidemia, body mass index, presenteeism, Absenteeism, indirect costs.*

INTRODUCTION

Obesity has become a health challenge in the 21st century. The World Health Organization (WHO) declared obesity is viewed globally has reached epidemic proportions. Data WHO in 2005, approximately 1.6 billion adults over age 15 are overweight, at least 400 million adults are obese and 20 million children under the age of 5 years are overweight.[1] In Indonesia, based on research data of 2013, the increase in rates of obesity occur in men and women, male obesity rates in 2010 was around 15 percent and in 2013 rose to 20 percent. In women, the percentage increase to 35 percent in 2013 from 26 percent in 2010.[2]

Obesity causes direct costs of treatment and indirect costs are very large. Australian obesity cost $ 637 million annually due to indirect costs (Indirect costs) associated with absenteeism, low productivity, unemployment, incapacity (disability), early retirement, as well as accidents. Plus the direct cost caused health costs of more than $ 1 billion.[3] Finkelstein (2010) state health expenditure per worker on average US $ 170 for workers with obesity (BMI 25.0 to 29.9) and US $ 1500 for workers with a BMI of 30 to 39.9, while the expenses for treatment for workers in America States per year are linked to obesity amounted to 147 billion US dollars in 2000-2001.[4]

Increased Body Mass Index (BMI), which leads to obesity can lead to the main risk factors for coronary heart disease, metabolic syndrome, dyslipidemia and diabetes mellitus among others obesity.[5] In people who are overweight shows plasma triglyceride levels were higher. Excessive triglycerides in the circulation also affects LDL (Low Density Lipoprotein) and HDL (High Density Lipoprotein) undergo lipolysis, will be the LDL and HDL, It is characterized by low levels of HDL cholesterol that cause dyslipidemia.[6] The increase in BMI of 1 kg / m2 will increase 5% for men and 7% for women at risk of chronic heart disease.[7]

The problem of obesity in the workplace, resulting in decrease productivity and it impacted the losses incurred by the company management as their presenteeism which allows decreased work productivity and Absenteeism.[14] Both of these, presenteeism and Absenteeism will impact significantly on the incidence of health problems that affect the direct medical costs and indirect costs issue because of time lost due to declining productivity.[9] Studies survey questionnaires at a fertilizer company in Gresik, East Java, Indonesia which has about 3000 workers.

METHOD

Population dislipidemia worker by Data HSE company 2015 means Dyslipidemia without Coronary Heart Disease complication and other metabolic diseases such as diabetes mellitus, hypertension and stroke is 166 people. Criteria Dyslipidemia is indicated to all or any of the criteria, cholesterol more than 250 mm / dl or triglycerides over 200 mm / dl, and LDL over 130 mm / dl. We will carry out the sampling research used a Slovin's formula, then the sample rounded up 117 people. With the addition of 5% so as to 121 workers. This research is an observational analytic research using a cross-sectional design about the influence of body mass index on dyslipidemia workers with labor productivity that includes absenteeism and presenteeism and indirect costs due to absenteeism. The exclusion criteria of this study is articipants who write incomplete data survey.

We used secondary data for measurements of weight, height to determine body mass index, and then do a questionnaire about presenteeism, absenteeism associated with body mass index. In this study, researchers use a World Health Organization (WHO) Health and Performance Questionnaire (HPQ) questionnaire instruments to simplify and translate the contents of the questionnaire according to the usage in the company. Participants completed an survey developed demographic and employment survey of the World Health Organization (WHO) Health and Performance Questionnaire (HPQ)[10]. The demographic and employment survey of participants asked to provide information about their age, education, job title.

Participants were grouped into four categories based on their BMIs in keeping with guidelines from the Indonesian Health Department: underweight (BMI<18,5), normal weight ((BMI 18,5-25.0), overweight (BMI 25.0 – 27.0), obesity (BMI> 27) . Descriptive analysis that shows the population characteristics of the participants. Absenteeism and presenteeism using bivariate analysis serves to connect between the independent variables and the dependent variable using Pearson correlation test. The level of significance used was 5% (α = 0.05). If the Pearson test requirements are not met then the alternative test is Spearman's correlation test. Interpretation of test results of hypothesis if the p-value <0.05, then there is a significant relationship between variables.

Presenteeism in HPQ describes respondents are asked to rate their overall work performance during the past four weeks on a 0-to-10 self-anchoring scale in which 0 is defined as the "worst possible work performance" a person could have on this job and 10 is defined as "top work performance" on this job compared to the average performance of the same workers in the same time. Absenteeism (hours) participant worked in the past 4 weeks (28day) compared to the working time rules set by the company[11].

RESULT

Table 1. Relationship characteristics of participants with a Body Mass Index (N = 121 person)

		Body Mass Index				
		Underweight (n=1) BMI < 18,5	**Normal (N=41) BMI 18,5- 25**	**Overweight (n=42) BMI 25–27**	**Obesity (n=37) BMI >27**	**Total (n=121)**
AGE (Year)	21-30	0	1(14%)	1(14%)	5(71%)	7
	31-40	0	0	0	0	0
	41-50	1(6%)	10(56%)	2(11%)	5(28%)	18
	51-60	0	30(31%)	39(41%)	27(28%)	96

Cont... Table 1. Relationship characteristics of participants with a Body Mass Index (N = 121 person)

		Body Mass Index				
		Underweight (n=1) BMI < 18,5	Normal (N=41) BMI 18,5- 25	Overweight (n=42) BMI 25–27	Obesity (n=37) BMI >27	Total (n=121)
Education	< High School	0	0	0	2(100%)	2
	High School	1(1%)	34(36%)	30(32%)	29(31%)	94
	Diploma	0	1(25%)	1(25%)	2(50%)	4
	Bachelor	0	5(25%)	11(55%)	4(20%)	20
	Magister	0	1(100%)	0	0	1
WORKER STATUS	Office	1(3%)	16(40%)	21(53%)	2(5%)	40
	Plant	0	25(25%)	21(26%)	35($#%)	81

BMI, body mass index is calculated as weight (kg)/height (m)2.

Description of Employees

Table 1 shows the age of group 51 to 60 years , overweight is about 40.6% of the total of 96 people and Obesity 28.1%. As for the age group 41 to 50, obesity is 27.8% of 18 people. High school education who is overweight 31.9% and 30.9% are obese from 94 participants. Work in the field most of the participants are obese 43.2% of 81 participants compared to participants who work in the office.

Presenteeism

Presenteeism here is the ratio of the actual performance with the performance of most of the workers at the same time, we limit the relative distribution of presenteeism between 0.25 up to 2.0, where 0.25 is the worst performance (25% or less than the performance of other workers) and 2.0 is the best performance (200% or more than the performance of other workers'). And 1 is an average performance.

Table 2. Relationship of Body Mass Index with presenteeism

Presenteeism	Body mass Index				Total	Kolmogorov-Smirnov[a] Statistic	Spearman's rho
	Under weight	Normal	Overweight	Obesity			
1.01-2.0	0 (0%)	15(39,5%)	15(39,5%)	8(21%)	38(100%)		r = 0,221
0.99-1.01	1(0,02%)	21(38,9%)	18(33,3%)	14(25,9%)	54(100%)	P = .222	p = 0,015
0.25-0.99	0(0%)	5(17,2%)	9(31%)	15(51,7%)	29(100%)		
Total	1	41	42	37	121		

P = Normality test, significant if less 0.05, r = Correlation Coefficient Spearman's correlation test, p= Correlation is significant at the 0.05 level (2-tailed).

The table 2. above shows, there are 29 participants has low productivity, while there are 38 participants perform better. 54 participants are average performers. 15 Obesity participants performance is below the average.

Table 2 also mentions Value Spearman r = 0.221, there is a relationship between body mass index with presenteeism time work, ie the higher the body mass index, higher presenteeism at work. The Significance value 0.015 fewer than 0.05. Ho is rejected, it means that there is a significant association between body mass index with presenteeism.

Absenteeism

Absenteeism or absence from work is calculated by taking into account the number of hours of work expected of companies with the number of hours worked during the month of participants. If the value is greater than 0 (zero) which says that a high score indicates a higher number of absences, if it is less than 0 (zero), then the employee works more than expected company in which it meant working overtime. The relative size of the attendance expressed as a percentage of the expected hour and ranges between negative numbers (work more than expected) and 1.0 (always present)

Table 3 Relationship of Body Mass Index with Absenteeism

Absenteeism	BODY MASS INDEX				Total	Kolmogorov-Smirnov[a] Statistic	Spearman's rho
	Underweight (n=1) BMI < 18,5	Normal (N=41) BMI 18,5- 25	Overweight (n=42) BMI 25–27	Obesity (n=37) BMI >27			
< 0	0	8	5	0	13	P = .254	r = 0,227
0	1	20	19	18	58		
> 0	0	13	18	19	50		p = 0,012
	1	41	42	37	121		

<0 is more than company rules, 0 is no absence, >0 is higher number of absence, P = Normality test, significant if less 0.05, r = Correlation Coefficient Spearman's correlation test, p= Correlation is significant at the 0.05 level (2-tailed).

From the table 3 above, Absenteeism is 40 %, overweight and obesity 74 percent participant who absence. Participants work according to the rules companies are 58 worker and then 13 people had more time work from the company rules.

The table also describes r = 0.227, there is a relationship between body mass index with Absenteeism, ie, the higher the body mass index, the higher Absenteeism. Significance Value 0.012 than 0.05 then Ho is rejected, it means that there is a significant association between body mass index with Absenteeism during working hours.

DISCUSSION

Labor productivity is associated with health problems, especially obesity. Workers with obesity often experience pain in the joints, knee pain and back pain that does not go away in the long term may worsen posture and difficult breathing, and breathing tend to be short because of the fat that has accumulated in the chest area and neck so as to make the person has trouble making or remove air to breathe. [8, 12,13]

Presenteeism is usually described in the specific behavior such as loss of concentration, worked no better than usual, feeling tired at work, and under expectations in the workplace. A randomized study of workers at several companies, expressed moderate and severe obesity workers are workers has a lot of limitations in his work and requires a longer time to complete the task.[3] In some workplaces, obesity restrict workers to do some kind of work for posture, muscle strength, cardiorespiratory capacity, range of motion, and so forth.[8,18]

Previous research has shown that obesity, especially for women, may have a negative impact on workers more often through presenteeism (ie, reduced productivity at work) rather than attendance.[14] Overweight can reduce the work activities due to the increased possibility of injury at work. 35-54 obese women were significantly more likely to report work-related injuries during the past year compared with the weight within the normal range.[15] Male workers aged 55-64 are obese have a higher risk of reducing their work activities due to long term health problems when compared with male peers of normal weight.[16]

In this study, presenteeism shows there are 29 people or 22 percent of those productivity below the average

performance of peers.Obesity participants performance is below the average of 15 people, at most than others. some of the main reasons are high job demands, stress, and there are no guarantees with the job. Spearman correlation coefficient value is r = 0.221 and the value significansi is 0015, there is a relationship between body mass index with presenteeism time work, ie the higher the body mass index, higher presenteeism at work.

Presenteeism relative size originally developed by WHO to measure the cost of labor health problems in terms of reduced job performance. Testing the validity showed a significant relationship between presenteeism and monotonous self-assessment and assessment based company (eg, peer review, supervisor assessment, or audit work) among the various parts of the job.[17]

Table absenteeism shows Spearman correlation coefficient value stated r = 0.227 and *p*= 0.012 there was a significant relationship between Body Mass Index with the working time Absenteeism, wich is the higher body mass index, the higher absenteeism.

In 2001 the Australian population who have obesity 21% did not come to work at least one day for 2 weeks because of illness or accident. This means that 4.25 million working days are lost in one year. Absenteeism in the State Australia associated with the many people who do not work, or sooner retire because of disability.[3]

CONCLUSION

1. Age, type of work contributed to the increased obesity, the average age of workers over 40 years so vulnerable to obesity. Kind of field work affects the nutritional status of workers.

2. There was a significant relationship between body mass index with presenteeism, ie, the higher the body mass index, higher presenteeism at work.

3. There is a relationship between body mass index with Absenteeism ie, the higher the body mass index, the higher the missed work at work.

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Improving the Operational Efficiency of OPD using Lean Method – Value Stream Mapping

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ABSTRACT

OPD is the mirror of the hospital, which reflects the functioning of the hospital being the first point of contact between the patient and hospital staff. Patients visit the OPD for various purposes, like consultation, day care treatment, investigation, referral, admission and post discharge follow-up. Hence the scope of OPD services extends to not only treatment but also preventive and promotive services.

However the OPDs are plagued with the problem of process delays like long waiting time. It's often one of the most frustrating part about the healthcare delivery system. Waiting time for elective care has been considered a serious problem in many healthcare systems since it acts as a barrier to efficient patient flow. This contributes to poor service delivery and a lackluster work environment. Non-value-adding activities result in, inter alia, long cycle and waiting times, and low staff morale.

A study was carried out in a Tertiary Care Hospital (TCH) in Pune to study the operational efficiency of the OPD by mapping the flow process and suggest means to improve it.

In order to improve operational efficiency by reducing bottlenecks in the workflow of the OPD a lean method – **Value Stream Mapping** was employed. With Lean thinking, health care managers can tackle specific issues to improve operational efficiency.

The entire OPD patient flow was mapped using a time motion study for a sample of 500 patients. Value Stream Mapping consisted of drawing the process flow as it was happening at present. It consisted of both Value Added & Non- Value Added activities. A **Value Stream Improvement Plan** was made to eliminate these bottlenecks or reduce the activities that do not add value, with reducing the delays as the **Value Stream Objective.**

AIM: To improve the operational efficiency of the Out Patient Department using the lean method.

OBJECTIVES:

- To map the current OPD flow process
- To identify the value adding and non-value adding activities
- To study and analyze the causes for "waste" or delayed process time.
- To create a value stream improvement plan to optimize the flow process.

SCOPE:

- The study examines the impact of Lean on operational efficiency only in the OPD; it does not extend to other departments in the hospital.
- The bottlenecks leading to increased waste or delayed process time in the OPD will be identified and reduced using lean (VSM).
- Streamlining the OPD flow process for maximization of efficiency will be achieved.
- The applicability of Lean is determined for the duration of the study, and the effect on cycle and waiting times and staff attitudes is looked at, but the sustainability thereof is not explored.

LIMITATIONS: • Patients visiting multiple doctors were excluded.

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Keywords: *Hospital Information System (HIS),operational efficiency, Out Patient Department (OPD),patient flow, Tertiary Care Hospital (TCH),Value Stream Mapping (VSM),waiting time.*

INTRODUCTION

The OPD forms the façade of the hospital and is invariably one of the most important services provided by the hospital. The OPD witnesses maximum footfall daily when compared to any other department in the hospital. This clearly highlights the importance of efficient and effective OPD management. If run effectively, the OPD can lessen the burden on the in-patient department dramatically.

There are various problems faced by the patients in outpatient department like overcrowding, delay in consultation, lack of proper guidance etc. that leads to process delay and disruption in the flow process. Nowadays, the patients are looking for hassle free and quick services in this fast growing world. This is only possible with optimum utility of the resources through multitasking in a single window system in the OPD for better services.

With Lean thinking, health care managers could tackle specific issues to improve operational efficiency.

Lean has been globally revolutionizing manufacturing and service industries for many years, and is advocated to "create a balance between quality and finance by developing the most efficient and effective method of providing value to the customer"

Lean is a novel management approach that offers the potential benefit of improving health-care service-delivery through the reduction of inefficiency. Since Lean aims to 'achieve more with less', even in systems with high variability such as hospitals, it could result in greater achievement of health-care objectives and outcomes with better process efficiencies at facility level.

The primary tool of Lean for identifying work activities and waste in the value stream is the current- and future-state Value Stream Map (VSM). This is a process flowchart which presents information about speed (cycle, lead and take times) of value-added work, non-value-added work and the continuity of flow.[1]

The present study was done in Tertiary Care Hospital, which is a state of the art hospital which has been set up by the pioneers of health care in Pune. It is a 120 bedded multispecialty hospital.

In order to improve operational efficiency by reducing bottlenecks in the workflow of the OPD a lean method – **Value Stream Mapping** was employed.

On an organizational level, mapping the entire process allows management to augment process steps that are value-adding and relevant to the final product or service for the customer, while systematically eradicating those that fail to add value.

LITERATURE REVIEW

The quest to be effective and efficient in the delivering of services is very critical in this age where resources are limited. The service industry is reforming, adopting and applying all available tools and techniques to improve quality for service consumers. Most of these approaches aim at identifying and removing waste and one of such is the Lean concept's methodologies and tools, which aim at identifying and reducing or removing process variation.

The Lean Concept is a growth strategy, a survival strategy, and an improvement strategy. The goal of lean is; first, to provide value to the patient/customer and, in doing so, eliminate the delays, overcrowding, frustration, irritation, and patient complaints associated with the existing system. [3]

Simply stated, Lean thinking is about achieving more with less. It is not about "sweating the assets" but about carefully analyzing how best to achieve a given result with the purpose of utilizing resources to their best advantage.[4]

Hospitals around the world are successfully implementing Lean methods for the benefit of patients, employees, physicians, and the hospital organizations.

The primary focus of Lean is on reducing waste, synchronizing flows and managing variability in (process) flows.[5]

Lean methodology is pinned on five tenets: [6, 7]

1. Specify value by asking oneself what is valuable to the end-user (the patient);

2. Identify the value stream using a Value Stream Map(VSM);

3. Make the value stream flow by restructuring process steps and eliminating, non-value adding steps (eliminating bottlenecks);

4. Pull: The forerunning process (e.g. collect medication from pharmacy) down the value-stream signals when upstream activities (e.g. doctor consultation) can begin in order to stabilize demand on the system.

5. Pursue perfection through continuous improvement.

While value stream mapping, or VSM, is a key tool used in many Lean Six Sigma projects for manufacturing, it's also widely used in healthcare. Value stream mapping can help map, visualize, and understand the flow of patients, materials (e.g., bags of screened blood or plasma), and information. The "value stream" is all of the actions required to complete a particular process, and the goal of VSM is to identify improvements that can be made to reduce waste (e.g., patient wait times).[8]

In 2006, at the 500-bed Flinders Medical Centre in Adelaide, Australia, Lean was implemented in the form of the Redesigning Care program, after it was reported that the emergency department was "bursting at the seams" with up to 1000 patients per month waiting for more than 8 eight hours before being treated.7, 21 Lean tools and techniques such as point kaizen and Value Stream Mapping benefited the center by reducing average patient waiting-times by 25% (70% of patients going home within 4 hours), as well as patients reneging from queues without seeing a doctor fell by 41%. The study also reported an easing of pressure felt by staff.[9,10]

A study by Pons (2012) of improving patient flow through an eye clinic In US, concentrated on the importance of making change in patient's journey by time management and utilizing the resources in better way. The change resulted in eliminating waste, speeding up the movement, attracting more people, enhancing the use of the space and reducing cost with increasing its recovery. In that clinic there were continuous investigations of patient flow and bottlenecks which helped in making wide improvement.

Case studies on reducing delays were done by the NHS Institute for Innovation and Improvement for Improving Patient Flow in the NHS in time period between years (2000 and 2007) at various departments of healthcare organizations in the UK. All of them succeeded in finding the bottlenecks and eliminated the unnecessary movement, delays or wastes in patient's pathway by applying mapping analysis method.

Similar examinations of patient movement and work flow was done by Ho (2014) at Singapore General Hospital to improve waiting time and operational clinic flow in a tertiary diabetes centre by optimizing the process and rearranging the time. Although the turn-around time (TAT) had just dropped from 108.23 minutes to 106.6 minutes, the percentage of patients seen by doctor increased 4% within 60 minutes and there was 36.6% reduction in waiting time at the cashier. This study showed the advantages of mapping patient's pathway in implementing change in a clinic.

Lean provides hospital managers with an evidence-based management approach to resolving problems and improving quality indicators in key focus areas such as patient waiting times. Hagg and Ganti provided useful descriptions for the adaptation and implementation of Lean methodologies in the health-care environment.

METHODOLOGY

Study Population:

All patients who came for OPD visit at the Tertiary Care Hospital.

Quantitative Method of Study-Observational time-motion study

The details of patients, time of his/her entry, the time taken by the patient to move through various departments, till the exit of the patient or IP admission was noted and recorded.

Sample Size –500 OPD patients.

Sampling Technique – Convenient Sampling

OBSERVATIONS AND ANALYSIS

Value in the perspective of the customer i.e. patient was specified as:

- Quick Service – No waiting
- Reliable Service – Correct diagnosis, correct treatment
- Low Cost
- Pleasant experience (Environment) – Courtesy, Care, Concern
- The entire flow process of the OPD was mapped using the value stream mapping method.

Value Added Activities were-

Table 1. – Value Added Activities and average time

Activity	Average Time
Registration/Billing	New Patient – 3.5 minutes Old Patient – 1.5 minutes
Consultation	13.9 minutes
Laboratory Investigations	13.6 minutes
Radiological Investigations	17.4 minutes
Pharmacy dispensing	10.2 minutes

Non Value Added Activities were identified as-

Table 2. – Non-Value Added Activities and average time

Activity	Average Time
Waiting time for billing	7.19 minutes
Waiting time for consultation	40 minutes
Waiting time for lab	12.72 minutes
Waiting time for radio investigations	36.05 minutes

The time motion study conducted in the OPD showed the various bottlenecks which caused "waste" i.e. waiting time. (Table 2)

The most important bottleneck in the entire OPD patient flow was found out to be the waiting time for consultation.

- Average=40minutes
- Appointment Patients=45.17minutes
- Walk in Patients=39.93minutes

A **Value Stream Improvement Plan** was made to eliminate these bottlenecks or reduce the activities that do not add value. This plan consisted of a root cause analysis of all the delays along with reducing the delays as the value stream objective.

The main causes of delay identified were:

Table 3. - Causes of delay

Delay in Billing	Delay in Consultation	Delay in entering the Lab	Delay in Radiological investigations
No queues formed patients gather around counters,, reception counter also acts as an enquiry counter, lab reports are also dispatched from here, correction of duplicate Registration, New staff takes time to get acquainted, Pacifying aggrieved/aggressive patients.	Unpunctuality of doctors, Clashing of OT and OPD timings, Doctors go on rounds, Improper OPD scheduling, HMIS based Appointment System not in use, Crowding due to first come first serve basis of many doctors.	Unavailability of lab technician, difficulty of reception staff to bill the tests due to inadequate training, Delay in decision making by the patient, Unavailability of residents for minor procedures.	Unavailability of technicians, Unavailability of equipment's, Delay in decision making by the patient.

By studying the patient flow process of the TCH two categories of patients were found-**Appointment patients and Walk in patients.**

It is of utmost importance to consider both these categories while designing the OPD flow process. However many discrepancies regarding the waiting time as well as overall satisfaction were observed since HIS was not used appropriately to integrate these elements into the flow.

The OPD waiting time should be less since the OPD had maximum number of patients with a prior appointment. However this was not the case, in fact appointment patients were found to have a longer waiting time as compared to walk in patients.

On doing **a root cause analysis** of the problem it was found that the main cause for this delay in appointment patients was **the disuse of the HIS based appointment system.**

RECOMMENDATIONS

Plan to eliminate delay due to waiting time for billing

- Displaying the consultant's timings in the OPD, as well as online will reduce the number of enquiries made by the patients.
- Introducing online appointment bookings.
- Lab reports should be dispatched at the lab counter and not in the OPD area or a separate counter for lab report dispatch and appointments.
- Proper training of the staff.
- Fixed Consultant timings and OPD rooms.

Plan to eliminate delay due to waiting time for consultation

- Patient Centric OPD scheduling, thus increasing utilization.
- Doctors should be advised to adhere to their allotted slots.
- Rounds should be taken prior to or after the OPD hours.
- Use of HMIS based appointment system.

Plan to eliminate delay due to waiting time for Laboratory–

- Receptionists should be trained adequately.
- All laboratory's HIS codes must be made available in a soft format to the receptionists.
- Lab technician must be available at all times.

Plan to eliminate delay due to waiting time for Radiology–

- Technicians should be available during their duty hours
- Follow a checklist at the start of every shift to check availability of all equipment's and accessories.

The following recommendations were made to overcome the scheduling error of the two categories of patients-

- In order to improve the appointment system in the OPD the HIS should be used optimally. The staff should be trained accordingly.
- Another method to streamline the OPD appointments using the HIS is to introduce online appointment bookings.
- A system generated SMS can be sent to the patient confirming his/her OPD timing along with the UHID number. This will prevent any late arrivals and will also reinforce the hospitals brand image.
- HIS generated consultation follow-up reminders can be sent to patients on a periodical basis, through various modes like tele-call, SMS, e-mail etc. Regular follow-up reminders/alerts will help in ensuring timely diagnosis and treatment.

The HIS based appointment system eliminates appointment overlapping which causes discontent among patients. The problem of long waiting time is also countered by the usage of this appointment system as the patients arrive only at the time of their appointments and not earlier.

The HIS prevents any errors in the appointment scheduling as the scope of human error is eliminated.

CONCLUSION

When used within healthcare, one obvious application for Value Stream Mapping is mapping a patient's path to treatment, to improve service and minimize delays.

To accurately map a system, obtaining high-quality, reliable data about the flow of information and the time a patient spends at or between steps is key.

Accurately timing process steps and using multi-departmental teams is essential.

Application of VSM to improves the efficiency of the OPD and also gives the following benefits:

- The patient gets the benefit of faster quality services
- Increased throughput–in terms of increased patients being serviced
- Better co-ordination between the various internal departments
- Revenue growth opportunities get explored as resources are made available
- Improved work culture
- Increases the overall satisfaction of the patients and the employees

There is no Conflict of Interest. Not funded by any organization.

The study was conducted as a part of Summer Internship Program, for the students of MBA (Health & Hospital Management), to study the managerial .There was no actual intervention in the patient care & hence no Ethical issues were involved.

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Study the Relationship between Mindfulness with Aggression, Perceived Stress and Social Anxiety in Students

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ABSTRACT

This study was aimed to investigate the multiple relationship between mindfulness with aggression, perceived stress and social anxiety. The study was a descriptive, cross - sectional and correlational research. To this end, 100 students from high school grade were selected by randomized multistage cluster sampling method. To collect data, the following questionnaires were used: Five-Factor Inventory of Mindfulness, Aggression Scale, Perceived Stress Questionnaire and Social Anxiety Questionnaire with acceptable validity and reliability. The statistical Pearson's correlation coefficient and multivariate regression methods were used to analyze the data, and the Cronbach's alpha approach was used to calculate reliability coefficient. The results showed that mindfulness is correlated with the rate of aggression, perceived stress and social anxiety. Also, the results of regression analysis indicated that each of the predictor variables are to some extent capable to predict the criterion variable variance.

Keywords: *Mindfulness, Aggression, Perceived stress, Social anxiety*

INTRODUCTION

If the involvement of human societies to a specific issue is considered as one of the important criteria of such a matter, one can claim that aggression is among the important issues that the humans have dealt with from the past up to now. According to dictionary, aggression follows the meaning of pugnacity. According to Montagu and Montagu (1976), most believe that aggression is an incentive that we should know more about it; we hurt others, attack them, and sometimes we kill each other[1]. Bandura (1986) also knew aggression as a behavior that is socially destructive and damaging. Aronson says in this regard: Aggression is among the instinctive and innate characteristics and human is an aggressive and militant animal[2]. According to Freud, aggression is mainly due to the suppression of instincts, which tends to self and self-hurting, and then to annoy others [3].

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Konrad Lorenzo also believes that aggression basically arises from an innate incentive to fight, which ensures that the strongest males would do mating and pass on their genes to the next generations [4]. One other important issue in the adolescence period is perceived stress. As a matter of fact, if all our needs are met automatically, life could be really easy; but, in fact, numerous personal and environmental barriers prevent such an ideal situation. These barriers requires us to cope with them and can also lead to stress[5]. Selye can be known as the first one to discuss stress as a new concept. He defines stress as the body's response against what it faces with and suggests that such a response is a non-specific one [6].

Stress has various levels and different forms, including mental, emotional and physical aspects that each has sometimes positive and sometimes negative impact on human health [7]. Richard suggests that stress is the pressure and erosion of the body when we adapt with the constantly changing environment. Such changes may cause us physical effects and can create positive or negative feelings in us [8].

However, humans are social creatures that communicating with peers and being valued by others

are among their basic needs. Therefore, because of the importance of social relationships, naturally, man is always afraid of negative evaluation by others. This fear that involves the fear of negative evaluation by others is referred to as social anxiety [9]. In a longitudinal study by Pine (1988) it has been found that social anxiety disorder in adolescence may cause emotional and anxiety disorders in the adulthood [10].

In fact, in case of social anxiety, age of onset is reported to be low, which is associated with high levels of functional impairments in the emotional, professional and interpersonal lives [11], quality of life [2-13], and friendships and romantic relationships [14]. It is even prior to the onset of other anxiety disorders, mood disorders and substance-related and substance abuse disorders [15].

The foundations of this concept can be traced back in ancient Buddhist texts. Mindful people perceive inner and outer realities freely and without distorting and have a great ability in dealing with a wide range of thoughts, emotions and experiences (both pleasant and unpleasant) [16-18]. This research tried to find the answer to the question that whether there is a single and multiple relationship between mindfulness with aggression, stress and anxiety of girl students of grade 9 in the high schools of district 2 in the city of Ahvaz?

METHODOLOGY

The population in this study included all female students of grade 9 in the high schools of district 2 in the city of Ahvaz who were enrolled in the academic year of 2016-2017. The study sample consisted of 100 subjects from the mentioned population, which were selected by multi-stage random sampling method. The statistical operations were made on 100 questionnaires.

Measurement Tool

Five-Factor Mindfulness Questionnaire

The Five-Factor Mindfulness Questionnaire (FFMQ) is a 39-item self-rating scale that have been developed by Bayer, Ruth, Smith et al. in 2006 through combining some items from mindfulness questionnaire (Freiburg -FMI), Mindful Attention Awareness Scale (MAAS) [16], Kentucky Inventory of Mindfulness Skills (KIMS) and mindfulness questionnaire using factor analysis approach.

Arnold H. Buss and Mark Perry Aggression Questionnaire

This 29-question questionnaire measures four aspects of aggression in physical, verbal, anger and hostility areas. The aggression questionnaire has been extracted from a pool of 52 questions that many of them were selected from the hostile questionnaire by using the principal component analysis and confirmatory factor analysis methods. The questionnaire, developed more than thirty years ago by Arnold H. Buss and Mark Perry, measures with a total score of questions the rate of general aggression, and the scores of its subscales show various manifestations of aggression [19].

Perceived Stress Questionnaire

It was developed in 1983 by Cohen et al. and has three 4-, 10- and 14-items versions that are used to measure general perceived stress in the past month. It assesses the thoughts and feelings about stressful events, control, overcoming and coping with stress and experienced stress. The scale also examines the risk factors in behavioral disorders and shows the process of stressful relationships. This questionnaire has been widely used in different countries, and thus, has been translated to many languages, normalized and used in many countries [5].

Watson and Friend Social Anxiety Inventory

The social anxiety scale has two subscales, including: (a) social avoidance and distress subscale (SAD) with questions from 1 to 28 and (B) fear of negative evaluation (FNE) subscale with questions from 29 to 58, which aims to identify and assess social anxiety that has been published in 1969.

Social avoidance and distress scale

This scale was developed by Watson and Friend in 1969 to identify and assess social anxiety. It consists of two subscales of social anxiety and social distress. The scale contains 28 items, half of which have positive responses and the other half have negative response. The score range is between zero and 28. Scores over 12 represents high social anxiety, while scores less than 4 indicate very low social anxiety.

Fear of Negative Evaluation Scale

Coinciding with social avoidance and distress scale, this scale was also made by Watson and Friend. It has

30 items that 17 have positive answers and 13 have negative answers. The score range is between zero and 30. Scores higher than 18 represent people who have a great fear of negative evaluation, and scores below 9 are for those who with little fear of negative evaluation. Someone with a high score on this scale is one who has neither control over himself nor on others, and most likely avoids situations with a chance of disapproval.

RESULTS

Table 1: Mean and standard deviation of variables of mindfulness, aggression, perceived stress and social anxiety of female students

Statistical indicators / Variable	Mean	Standard deviation	Number
Mindfulness	126.19	14.31	100
Mindfulness in the area of observation	28.92	5.43	
Mindfulness in the area of description	22.54	4.31	
Mindfulness in the area of action with awareness	29.63	7.24	
Mindfulness in the area of non-judgment	22.73	5.47	
Mindfulness in the area of non-reaction	22.37	3.88	
Aggression	77.65	15.10	
Perceived stress	39.67	7.38	
Social anxiety	27.64	8.25	

Table 2: Simple correlation coefficients between mindfulness and aggression of girl students

Criterion Variable	Statistical index / Predictive Variable	Correlation coefficient (r)	Significance level (p)	Sample Number (n)
Aggression	Mindfulness	-0.35	0.0001	100
	Observation component	-0.02	0.788	
	Description component	-0.20	0.041	
	Action with awareness component	-0.43	0.0001	
	Non-judgment component	-0.20	0.047	
	Lack of reaction component	0.05	0.614	

Table 3: Single correlation coefficients between mindfulness and perceived stress of female students

Criterion Variable	Statistical index / Predictive Variable	Correlation coefficient (r)	Significance level (p)	Sample Number (n)
Perceived Stress	Mindfulness	0.42-	0.0001	100
	Observation component	-0.19	0.050	
	Description component	-0.22	0.023	
	Action with awareness component	-0.45	0.0001	
	Non-judgment component	-0.11	0.283	
	Lack of reaction component	-0.03	0.755	

Table 4: Singe correlation coefficients between mindfulness and social anxiety of female students

Criterion Variable	Statistical index / Predictive Variable	Correlation coefficient (r)	Significance level (p)	Sample Number (n)
Social anxiety	Mindfulness	0.43-	0.0001	100
	Observation component	0.15-	0.131	
	Description component	0.25-	0.013	
	Action with awareness component	0.42-	0.0001	
	Non-judgment component	0.31-	0.001	
	Lack of reaction component	0.11	0.251	

Table 5: Multiple correlation coefficients of predictive variables (components of mindfulness) with aggression of female students by simultaneous and stage input method

Method	Predictive variables	R	R^2	F	= p	β	t	= p
« Input »	Observation	0.45	0.20	14.76	0.0001	0.04	0.381	0.704
	Description					0.02	0.184	0.854
	Action with awareness					-0.44	-4.02	0.0001
	Lack of judgment					-0.10	-0.923	0.359
	Lack of reaction					-0.07	-0.695	0.489
« Stage»	Action with awareness	0.43	0.19	22.83	0.0001	-0.43	-4.77	0.0001

Table 6: Multiple correlation coefficients of predictive variables (components of mindfulness) with perceived stress of female students by simultaneous and stage input method

Method	Predictive variables	R	R^2	F	= p	β	t	= p
« Input »	Observation	0.48	0.23	5.81	0.0001	-0.11	1.14-	0.256
	Description					0.04	0.390	0.697
	Action with awareness					0.0001-	4.34-	0.0001
	Lack of judgment					0.0001-	0.576-	0.566
	Lack of reaction					0.0001-	1.33-	0.185
« Stage»	Action with awareness	0.45	0.21	25.94	0.0001	-0.45	5.09-	0.0001

Table 7: Multiple correlation coefficients of predictive variables (components of mindfulness) with social anxiety of female students by simultaneous and stage input method

Method	Predictive variables	R	R^2	F	= p	β	t	= p
« Input »	Observation	0.49	0.24	6.06	0.0001	-0.16	-1.56	0.120
	Description					-0.04	0.347	0.729
	Action with awareness					-0.35	-3.17	0.002
	Lack of judgment					-0.27	-2.67	0.009
	Lack of reaction					-0.01	-0.139	0.890
« Stage »	Action with awareness	0.42	0.18	21.29	0.0001	-0.42	-4.61	0.0001
	Lack of judgment	0.47	0.22	13.96	0.0001	-0.36	-3.92	0.0001
						-0.22	-2.37	0.020

DISCUSSION & CONCLUSION

Study of mindfulness through authentic instruments has come to the attention of many authors in recent years. What made these efforts valid has been the importance of the concept of mindfulness and its efficacy in reducing the rate of aggression, perceived stress, social anxiety and other psychological symptoms. According to the results of this study, there is a significant relationship between mindfulness and aggression of female students. One can say that aggression is a kind of psychological mechanism in which a person unconsciously shows the pressures due to his frustrations and failures as reactions like assault, violation and vicious and aggressive behavior. Only if these behaviors are got under control, the growth trend will become normal and desirable [18].

Scientists have different opinions about aggression. Some consider it an instinctive behavior, while some others see it as a social behavior that is learned, and some consider it an external drive. Frustration-aggression theory suggests that aggression occurs following the frustration. It should be however remembered that aggression can have latent or obvious aggressive state. This means the target of aggression may be the individual himself or another person [20]. What has drawn the attention of researchers to aggression is the consequences of these behaviors in adolescents. Aggressive adolescents usually cannot restrain their behavior, and easily violate the norms and values of the society in which they live [21]. Crick & Dodge (1996) view aggression as an evolutionary phenomenon that occurs due to the individual defect in the processing of social information. Given that aggression has several dimensions, including emotional, intellectual and behavioral aspects, thus, mindfulness is designed in such a way to affect all of these dimensions. Through making cognitive change in the thinking and actions of a person by using the conditional strengthen principles, mindfulness reduces aggression. Also, mindfulness makes adjustments in feelings without judgment and raises awareness toward mental and physical emotions and feelings. It help us to clearly see and accept the emotions and physical phenomena as they happen. Hence, it can play an important role in modulating aggression [22].

The results obtained are consistent with the results of Fajorbak et al. study (2011). In addition, according to Myers research (2004), only ill-mannered focus and attention are based on anger and aggression symptoms, and increased attention control should be effective in reducing anger [23]. According to Lazarus & Folkman model [24] and Lazarus & Folkman [25] stress first starts with an initial assessment of stimuli that the stimuli are inherently threatening or dangerous. When a stimulant is evaluated as challenging, harmful and threatening, the physiological system becomes active, and a stressful mental perception of the stress situation would occur. If the individual does not have sufficient resources to deal

with stress during this complicated evaluation, then, he will experience physical, psychological, and social symptoms of stress. The stress of adolescent students involves mostly subjective and cognitive aspects understanding. They have pointed out that mindfulness and its related exercises give an individual the chance of observing thoughts, emotions and sensations in the absence of catastrophic consequences due to the characteristic of facing with stressful thoughts and feelings.

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Knowledge and Preventive Practices Regarding Dengue Fever among Adults Accompanying Patients in a Tertiary Care Hospital in Rural Area of Sonepat

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ABSTRACT

Background: In 2015, there have been large outbreaks of dengue fever (DF) worldwide and Delhi, India, recorded its worst outbreak since 2006 with over 15,000 cases.

Objective: To assess the knowledge and preventive practices regarding DF among adults accompanying patients in a tertiary care hospital in rural area of Sonepat.

Method: A hospital based cross-sectional study was conducted on 103 randomly selected adults accompanying patients during the period December 2016 and January 2017. A pretested, structured questionnaire was administered through face-to-face interviews. Data were analysed using R software.

Results: Majority of the respondents (97%) had heard about dengue. The most important source of information was television (47.6%). Maximum participants (87.4%) answered fever as the presenting symptom, whereas (7.8%) did not know any of the symptoms of dengue. More than two third (81.5%) knew that the dengue was transmitted by mosquito bites. Less than half (44.7%) respondents correctly reported biting time of mosquito vector. Furthermore, 81.5% the respondents consulted the physician on getting fever during dengue outbreak. About 88% of participants mentioned wearing of full sleeve clothes as a predominantly used preventive measure against mosquito bite.

Conclusions: Although the knowledge regarding dengue was high and overall practices were good, but knowledge does not equate with preventive practices. More emphases of health education should be laid on putting the knowledge into practices. Improvements in dengue knowledge and preventive practices are needed to enhance community participation to control dengue outbreak.

Keywords: *Dengue, Knowledge, Practices, Rura*

INTRODUCTION

Dengue fever and dengue hemorrhagic fever (DF/DHF) are caused by dengue viruses (DENVs), which form the dengue complex in the genus Flavivirus, family Flaviviridae.[1] DENVs are transmitted by the day-biting mosquito Aedes aegypti and cause more human morbidity and mortality than any other arthropod-borne virus.[2,3] Dengue is characterized by a sudden onset of high fever (103-106°F), severe headache, backache, intense pain in joints and muscles, retro-orbital pain, nausea and vomiting and a generalized erythematous rash that usually begin 4-7 days after the mosquito bite and typically last 3-10 days.[4]

Dengue is emerging as one of the world's most rapidly spreading and important infectious diseases of the 21st century. [4,5] The total number of dengue infections per year has been estimated at 390 million, of

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which 96 million are symptomatic; 500,000 are severe requiring hospitalization, and 20,000 are fatal.[6-8] Out of 96 million global symptomatic cases of dengue, nearly two-third are from Asia.[6] In 2015, there have been large outbreaks of DF worldwide and Delhi, India, recorded its worst outbreak since 2006 with over 15,000 cases.[9] In the absence of a vaccine or specific treatment, vector control is one of the most important preventive measures in combating dengue.[10]

Primary prevention which includes use of mosquito repellents, mosquito bed nets, mosquito coils, protective clothing and regularly removing sources of stagnant water to prevent mosquito breeding is suggested as the most effective measure in dengue prevention and control.[10] Dengue fever is a preventable infection, and success of dengue control depends mainly on knowledge and preventive practices of the communities towards the disease. Knowledge and preventive practice studies serve to halt the transmission of dengue. It has been shown that community education could be more effective than insecticide spraying alone in reducing mosquito breeding habitats.[11] Community participation for control of the dengue outbreak depends on the community awareness. Limited studies have been conducted in the study area to examining what people currently know and practice for dengue prevention. Therefore, the present study was conducted with objective to assess the knowledge and preventive practices regarding dengue fever among adults accompanying patients in a tertiary care hospital in rural area of Sonepat.

METHOD

This hospital based cross-sectional study was conducted among adults accompanying patients in BPS Government Medical College For Women and Hospital during the period December 2016 and January 2017. This tertiary hospital is located in a rural area of Sonepat district of Haryana. Assuming the prevalence of knowledge about dengue fever and its preventive practices as 50%, along with relative precision of 20%, the sample size arrived was 96. The sample size was increased by 10% to allow for any missing or incomplete data that occurred during data collection. Consequently, the required sample size was 106. Because of lack of information, three participants were excluded from analysis and 103 participants with all records were included in the study. Systematic random sample design was adopted to produce a representative sample of study population. Participants, 18 years of age and above and willing to participate were included in the study.

The participants were explained the objective of the study. A verbal informed consent was taken from the participants. For data collection, tools were developed, pre-tested, and administered to the subjects. Techniques used to collect the data were face-to-face interviews using structured questionnaire schedules. It included questions on sociodemographic characteristics, knowledge, and preventive practices of the respondents towards dengue fever. All statistical analyses were performed using R statistical software. The results were presented in form of frequency and proportion.

RESULTS

Table 1 shows the sociodemographic characteristics of the study subjects. Out of total 103 participants, slightly more than half 55 (53.4%) were females, and 48 (46.6%) were males. Majority 72 (69.9%) were in the age group of 18-40 years followed by 23 (22.3%) and 8 (7.8%) in 41-60 years and more than 60 years of age group respectively. The mean age was 35.1 ± 13.8 years. Most of them 45 (43.7%) had completed high school, and 24 (23.3%) had middle school level education, while 16 (15.5%) were illiterates. Majority 45 (43.7%) of the respondents were homemaker, 18.4% were engaged in agriculture and 10.7% were students. Rest 8.7% were in service, while 6.8% were laborers.

In Table 2, findings show the knowledge of respondents regarding dengue. Among the study participants, majority 100 (97%) had heard about dengue. The most important source of information was television (47.6%), followed by health care providers (31.1%) and newspaper (19.4%). Radio was reported as source by 7 (6.8%) of the participants. About 81.5% respondents knew that the vector for dengue is a mosquito. In addition, 2.9% of the study subjects failed to correctly answer the question about vector for dengue and 15.5% did not know. Less than half (44.7%) respondents correctly reported biting time of mosquito vector. Maximum 90 (87.4%) responses reported by the respondents were for fever as symptom of dengue. Another symptoms mentioned by the participants were joint pain (49.5%), abdominal pain (42.7%), skin rash (41.7%), and bleeding (33%). Least response (26.2%) was for retro-orbital pain as symptom of dengue, whereas (7.8%) did not know any of the symptoms of

dengue. Only (42.7%) were aware of the fact that dengue is communicable disease.

The preventive practices of the study subjects are presented in Table 3. Common preventive practices for controlling breeding sites of mosquito were keeping water containers covered (90.3%), removal of water from pots (88.3%) and removal of water from cooler regularly (82.5%). Regarding personal protection against mosquito bites, about 88% of participants mentioned wearing of full sleeve clothes as a predominantly used preventive measure. Mosquito spray was used by (70.9%) of the participants, while mosquito net was used by (66%) of the participants and these were used during the night. About (81.5%) of respondents consulted the doctor immediately if they had fever during the dengue outbreak, while (18.5%) took medication by their own.

DISCUSSION

In the present study, slightly more than half (53.4%) were females. It can be useful in addressing issues of women's health activities effectively. This finding is in contrast to findings in studies conducted in tertiary care hospitals in New Delhi and Puducherry where only one forth participants were female.[12,13] Majority (69.9%) were in the age group of 18-40 years. This is an indication that maximum participants were young and mature adults. Most of them (43.7%) had completed high school, and only (15.5%) were illiterates. Educated respondents may be more likely to understand the health messages and may feel more confident to carry out preventive practices. Majority (43.7%) of the respondents were homemaker. The finding reflects the more female participants in the sample. In the study conducted in a tertiary care hospital in Puducherry, majority (62.5%) of the study population belong to the age group of 21 to 40 years and most of them (64%) had gone to schools.[13] In another study conducted in a rural area of Tamil Nadu, females constituted more than 50% as participants and 36.6% as home makers (table 1).[14]

Among the study participants, majority (97%) had heard about dengue. Similar findings were found in another hospital based studies.[12,13] Higher knowledge about dengue was associated with past history of dengue in the family. In the present study, the most important source of information about the dengue among study subjects was television (47.6%) and radio was reported as source by (6.8%) of the participants. In another hospital based studies, it was found that about three fifth participants came to know about dengue through TV and/or radio.[13,15] This is similar to a study from south Delhi.[16] In our study, about 81.5% respondents knew that the vector for dengue is a mosquito. This finding is similar to the result of another studies where 90% and 83% of study participants were aware of the vector of dengue.[13,17] Less than half (44.7%) respondents correctly reported biting time of mosquito vector. The knowledge about daytime biting behavior of the participants was poor. In a hospital-based study in New Delhi, only 24% reported daytime biting behavior of mosquito.[12] In the current study, maximum (87.4%) responses reported by the respondents were for fever as symptom of dengue followed by joint pain (49.5%). In another studies conducted in Puducherry, it was found that 50% and 59% of participants mentioned fever as the most common presenting symptom of dengue respectively.[13,18] In the present study, only (42.7%) were aware that dengue is communicable disease. In a study conducted in Karachi, Pakistan, about one fourth of adult respondent reported that dengue is a contagious disease (Table 2).[19]

In the current study, common preventive practices for controlling breeding sites of mosquito were keeping water containers covered (90.3%). This is similar to hospital based studies where 96% participants keep the water containers at home covered with a lid and 87.5% participants followed the practice of keeping water containers closed at home.[13,20] In the present study, these respondents were also more likely to perform some control measures, such as removal of water from pots (88.3%) and removal of water from cooler regularly (82.5%). Regarding personal protection against mosquito bites, about 88% of participants mentioned wearing of full sleeve clothes as a predominantly used preventive measure. Mosquito spray was used by (70.9%), while mosquito net was used by (66%) of the participants and these were used during the night. Dengue prevention practices were incorrect regarding using mosquito net and mosquito spray at night only. In one hospital study, 43% of study participants mentioned the practice of using mosquito coils as a preventive measure and in another hospital based study, about 47.5% respondents stated the use of mosquito coils/ mat as a preventive measure against mosquito.[13,21] About (81.5%) of respondents consulted the doctor immediately if they had fever during the dengue outbreak. This practice reflects good health seeking behavior of the study participants (Table

3).

Table 1: Socio-demographic profile of the study participants (n=103)

Characteristics	Frequency	Percent
Sex		
Female	55	53.4
Male	48	46.6
Age (years)		
18-40	72	69.9
41-60	23	22.3
>60	8	7.8
Educational status		
Illiterate	16	15.5
Primary	9	8.7
Mid school	24	23.3
High school	45	43.7
Graduation	9	8.7
Occupation		
Agriculture	19	18.4
Serviceman	9	8.7
Shopkeeper	6	5.8
Labourer	7	6.8
Home maker	45	43.7
Unemployed	6	5.8
Student	11	10.7

Table 2: Distribution of respondents by knowledge about Dengue (n=103)

Variables	Frequency	Percent
Heard about dengue		
Yes	100	97.1
No	3	2.9
Source of information*		
Television	49	47.6
Health care providers	32	31.1
News paper	20	19.4
Radio	7	6.8
Vector for dengue fever		
Mosquito	84	81.5
Water	3	2.9
Don't know	16	15.5
Breeding sites of dengue mosquito		
Clean stagnant water	59	57.3
Dirty water	32	31.1
Don't know	12	11.6
Biting habit of dengue mosquito		
Day	46	44.7
Night	22	21.4
Don't know	35	33.9
Symptoms of dengue*		
High fever	90	87.4
Skin rashes	43	41.7
Retro orbital pain	27	26.2
Joint pain	51	49.5
Bleeding	34	33.0
Abdominal pain	44	42.7
Dengue is communicable		
Yes	44	42.7
No	59	57.3

*** Multiple response**

Table 3: Distribution of participants by preventive practices regarding dengue (n=103)

Variables	Frequency	Percent
Controlling breeding sites*		
Removal of water from pots	91	88.3
Cover water containers	93	90.3
Removal of water from cooler regularly	85	82.5
Personal protective measures*		
Use mosquito net	68	66.0
Use mosquito spray	73	70.9
Full sleeve clothes	91	88.3
What do you do when you get fever during dengue outbreak?		
Immediate medical attention	84	81.5
Take medication on own	19	18.5

*** Multiple response**

CONCLUSIONS

Although the knowledge regarding dengue was high and overall practices were good, but knowledge does not equate with preventive practices. More emphases of health education should be laid on putting the knowledge into practices. Improvements in dengue knowledge and preventive practices are needed to enhance community participation to control dengue outbreak.

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The Influence of Leadership, Experience of Work, and Motivation to Performance of Nursing Employees Personnel in Banjarmasin

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ABSTRACT

Hospital is a health care institution which organizes personal health services in the plenary that provides inpatient, outpatient, and emergency department. Medical support officer in a hospital is a human resource which is non-physical infrastructure that is necessary for the achievement of organizational goals. Leadership as human resource which is occupying a key position or the policy makers are no less important for the success of an organization itself. The highest level of leadership or hospital directors is spearheading leadership in directing all available resources, both physical and non-physical so that the organization be able to make changes towards continuous improvement. The purpose of this research is to know the influence of the leadership, work experience and work motivation on performance of nursing employee personnel in Banjarmasin. This research method using the quantitative survey. This research technique using the formula of slovin with a sample of 108. The results showed no influence of leadership with employee performance (p-value= 1.000), there is no influence between work experience with employee performance (p-value= 1.000), there is no influence between motivation and employee performance (p-value= 0.462). The conclusion of this study there was no influence of leadership, work experience, and motivation on performance of nursing employee at hospital in Banjarmasin.

Keywords: *Leadership, Work Experience, Motivation*

INTRODUCTION

Effective leadership, can give guidance to the efforts of every employee in achieving organizational goals, and in arranging his subordinates, a leader must be able to read the right situation, so that be able to give a view in solving problems. Good leadership required to develop employees and build employee's loyalty in order to increase productivity[1]. In addition to the leadership, motivational factors that will influence the working climate of organization, owns by the employee is a potential, which the person may not be willing to mobilize all its potential to achieve optimal results. The style of leadership is a key factor in public sector organizations. A leader is required to carry and maximize the organization that he led to provide a quality serviceand achieve people's optimal satisfaction. The style of leadership is how leaders influence employees to work better in order to achieve organizational goals because essentially public sector organizations formed to provide services to the public[2,3].

Work experience can also affect the performance of employees in a company. Work experience is very important in running the business of an organization. By obtaining work experience, the tasks assigned be able to be done properly. Work experience in similar work, need to get consideration in employment. Reality shows the longer the labor work, the more experience owned by that concerned workers[4].

Motivation is one of the elements that exist in a person to produce behavior that can improve performance by fulfilling the needs. Motivation is the encouragement inside the nurse so that they want to improve their performance to fulfill their needs. Performance of nurse which is meant is the nurse's activity tasks that must be accomplished by nurses[5].

MATERIAL AND METHOD

This study is an analytic observational study with cross sectional design. The study was conducted in Banjarmasin. The study population is nursing personnel employees in Banjarmasin City's Hospital as many as 148 people. A sample size of 108 people using the formula of slovin. Sampling in this field's skill activities using purposive sampling technique. Data analysis of univariate and bivariate using Fisher's exact test.

The variables studied were the employee's performance, leadership, work experience, and motivation. Variable of employee's performance is an outcome which is generated from employees, performed during a specific time period with both categories: a score of 9-15 and less: a score of 3-8. Variable of leadership's ability to influence, manipulate and direct the actions of a person or group of people in a given situation and to achieve the goal with both categories: a score of 12-20 and less: score 4-11. Variable of work experience is knowledge or skills already known and controlled by a person as a result of any act or work that has been done before for a certain period of time with both categories: a score of 12-20 and less: score 4-11. Variable of motivation is a certain psychological states in a person that arise because of the urge to fulfill the needs with good category: score 12-20 and less: score 4-11. Data of each variable was obtained using a questionnaire instrument.

RESULT AND DISCUSSION

1. Univariate Analysis

Based on the results of a study of 108 respondents, obtained the frequency's distribution of leadership at the Hospital in Banjarmasin presented in Table 1.

Table 1. Frequency's distribution of leadership at the Hospital in Banjarmasin

Variable	Frequency (people)	Percentage (%)
Leadership		
Not good enough	3	2,8
Good	105	97,2
Work experience		
Not good enough	1	0,9
Good	107	99,1
Work's motivation		
Not good enough	20	18,5
Good	88	81,5
Employee's performance		
Not good enough	3	2,8
Good	105	97,2
Total	108	100

Table 1 shows the distribution and frequency of leadership of 108 respondents selected in this study. From 108 respondents there are 3 (2.8%) respondents said that the leadership is not good and there are 105 (97.2%) of respondents said that the leadership id good, the distribution and frequency of respondents more numerous in respondents which is saying good leadership. Based on the results of questionnaires, from three respondents (100%) stating poor leadership means there is still a lack of a relationship between a leader and employee. In addition, two respondents (66.67%) stated that the leader does not always give orders to subordinates and leaders are less able to act decisively against subordinates. While one of the respondents (33.33%) state leaders are less able to divide the work towards his subordinates. This statement causes unfavorable ratings in the category of leadership.

Based on the results of a study of 108 respondents, obtained the frequency's distribution of work experience at the Hospital Banjarmasin presented in Table 1. Table 1 shows the distribution and frequency of employee's work experience of 108 respondents selected in this study. From 108 respondents there is 1 (0.9%) of respondents have poor working experience, and 107 (99.1%) of respondents have a good working experience. Based on the results of the questionnaire of 1 respondent (100%)with less work experience, stating that the respondent still do not have the skills above the average of other employees.In addition, respondent expressed a neutral to a statement that the high knowledge is very helpful in doing the job, the ability to master the work that has been given by the hospital. Respondent also expressed neutral in controlling equipment provided at the hospital. So this causes a negative assessment of work experience owned by the respondent.

Based on the results of a study of 108 respondents, obtained frequency's distribution of work's motivation in hospitals in Banjarmasin presented in Table 1. Table 1 shows the distribution and frequency of work's motivation of 108 respondents selected in this study. From 108 respondents there are 20 (18.5%) of respondents have less motivation of work well and there are 88 (81.5 %%) of respondents have a good work motivation. motivation felt by employees may decrease or increase organizational commitment or organizational commitment of employees. Based on the results of questionnaires from 20 respondents who claimed to have less motivation to work well,obtained 10 respondents (50%) stated that the salary received from agencies is not enough to fulfill daily needs.

In addition, five respondents (25%) also stated that the allowance can not be motivated in their work. A total of 11 respondents (55%) stated that the attention of a superior does not determine motivation to work more diligently. In addition of 18 respondents (90%) said that they are not trying hard to receive an award from superiors. This kind of statement stating by employees resulting in low motivation to work on the employee's Hospital in Banjarmasin.

Based on the results of a study of 108 respondents, obtained frequency's distribution of employee's performance at the Hospital in Banjarmasin presented in Table 1. Table 1 shows the distribution and frequency of workplace performance of 108 respondents selected in this study.

From 108 respondents there are 3 (2.8%) respondents said that their performance is poor and there are 105 (97.2%) of respondents said that their performance is good. Based on the results of questionnaires from three respondents (100%) stating that the employee's performance is not good, they feel not able to work together in doing the job. In addition, two respondents (66.67%) stated that their skill is not in accordance with the work that they done. While two respondents (66.7%) stated that the quantity or amount of work that the employees are doing during a period not exceeding any other employee.

This resulted in poor employee's performance appraisal on employee's Hospital in Banjarmasin. Performance is the result of work that can be achieved by a person or group of people within an organization in accordance with the authority and responsibilities of each in order to attempt in achieving organizational goals legally, does not violate the law and in accordance with moral and ethical.Human resources performance is the result of work during a certain period in comparison with the standard range of possibilities eg targets / goals or criteria that have been agreed[6,7].

2. Bivariate Analysis

Based on the research's results of leadership's, work experience, and work motivation influence with employee's performance of 108 nurses at the hospital in Banjarmasin can be seen in Table 2.

Table 2. Leadership's, work experience, and work motivation influence with employee's performance

Variable	Employee's Performenance		Total	p-value
	Not Good	Good		
Leadership				
Not good	0 (0%)	3 (100%)	3 (100%)	1,000
Good	3 (2,9%)	102 (97,1%)	105 (100%)	
Work experience				
Not good	0 (0%)	1 (100%)	1 (100%)	1,000
Good	3 (0,8%)	104 (97,2%)	107 (100%)	
Work motivation				
Not good	1 (5%)	19 (95%)	20 (100%)	0,462
Good	2 (0,3%)	86 (97,7%)	88 (100%)	

Table 2 shows that there is no influence between leadership and employee performance at the Hospital in Banjarmasin (p-value = 1.000)> 0.05. There are 3 people with not good leadership but good performance (100%) it is because the respondents have perception that every employee with all positions and jobs are always required to provide outputs that can be profitable for the hospital. So that the employee's performance also relies on the accuracy and efficiency of work behavior of each employee. Factors that affect a person's performance is

the ability, in which the ability of employees consists of the ability of the potential and ability and skills means that employees who have the skills on the job, the employee will be easier to achieve the expected performance[8].

Good leadership and good performance of employees, there are 97.1% it is because the presence of leaders within a company or organization is very important because it is the backbone and have strategic role in achieving organizational goals. An effective leader must have an agenda in achieving organizational goals, the challenges and possibilities that will happen and to fulfill his desire with a new vision and communicating it and inviting subordinates together to achieve the new goals by using resources and energy as efficient as possible. Proper leadership can lead to employee's motivation to achieve, because the success or failure of employees in filing job performance, the better the relationship between the leader and the employee, the more structured the job done and the stronger the power of the leaders in employee's performance. Relations between the leaders and the members with regard to the degree of emotional quality of the relationship, which includes level of familiarity and acceptance of members towards their leaders. The more confident and trust their members to leaders, the more effective the group in achieving its goals. After achieving a common goal, the more enthusiastic members in doing their jobs without having to be forced by the leader because it has already carried out daily[8,9].

Based on the results of the study of the relationship between work experience with employee's performance of the 108 nurses at the hospital in Banjarmasin can be seen in Table 2. Table 2 shows that there is influence between work experience with employee performance of a nurse at the Hospital in Banjarmasin (p-value = 0.001)> 0.05. The experience of employees which is less good but good performance is 1 (100%) due to the education of its last diploma, diploma here can be seen more frequently in direct practice to the field in taking care of the patient so that they have good work performance, development of behavior and attitudes in the decision to take the appropriate action that can be pose a high confidence so that they have good employee's performance[10].

The experience of working on similar work needs to get consideration in employment. Reality shows the longer the labor work, the more experience of the workforce concerned. Experience of working give a lot to provide expertise and work skills. Experience of working is the main asset for someone to go into a particular field. Large hospitals are more likely to consider mature working experience, direct impact on employee professionalism in carrying out the task[10].

Based on the results of research of the influence between work motivation and employee's performance of nurses at the hospitals in Banjarmasin on 108 nurses can be seen in Table 2. Table 2 shows that there is an influence between experience of working with employee's performance of a nurse at the hospital in Banjarmasin (p-value = 0.462)> 0.05. Motivation can be said as a desire to exert every effort in order to achieve specific objectives determined by the ability of individual work motivation to meet the needs of individuals or organizations. Less work motivation but good employee's performance, there are 19 people (95%) due to the environments / condusive conditions ofHospital in Banjarmasin that will evoke the spirit or passion of working of employees, or in other words a good working environment such as preparation of the workplace , layout and equipment of good offices, will help smoothen the process of implementation of the tasks thus increasing employee's performance. The good relationship between one nurse to another also make employees feel comfortable while working. All superiors firm but remained friendly to members. In line with the research of Ida Ayu (2006), no relation to performance due to a lack of motivation is: self-actualization, achievement in work, the opportunity of creativity, growth and development[11].

CONCLUSION

Based on the research conducted, it shows that there is no influence of leadership, experience and motivation to employees performance at Hospitals in Banjarmasin. Although there is no effect, we should still maintain aspects of management and leadership at the hospital so that the services provided to customers still in good quality and professional and also give satisfaction to the service's users.

Ethical Clearance: This study approved and received ethical clearance from the Research Ethics Committee of Medical Faculty, Lambung Mangkurat University, Indonesia. In this study we followed the guidelines from

the Committee Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia for etchical clearance and informed consent. The informed consent included the research tittle, purpose, participants's right, confidentiality and signature.

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Safe Limits Concentration of Ammonia at Work Environments through CD8 Expression in Rats

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ABSTRACT

It has been widely reported incidence caused by acute and chronic effects of exposure to ammonia in the working environment in Indonesia, but ammonia concentration was found to be below the threshold value. The purpose of this study was to determine the safety limit concentration of ammonia in the working environment through the expression of CD8 as a reference for determining the threshold value of ammonia in the working environment.

This research was a laboratory experimental with post test only control group design using experimental animals as subjects experiment.

From homogeneity test results indicated that the weight of white rats exposed and control groups had a homogeneous variant with a significant level of p (0.701) > α (0,05). Description of the average breathing rate is 0.0013 m3 / h. Average weight rats based group listed exposure is 0.1405 kg. From the calculation IRS IRS CD8, CD8 highest score in the doses contained 0.0154, with the location of the highest dose of ammonia without any effect on the lungs of rats is 0.0154 mg/ kg body weight of mice. Safe Human Dose (SHD) ammonia is 0.002 mg/ kg body weight workers. The safety limit concentration of ammonia gas in the working environment of 0,025 ppm.

Keywords: *Safe Limits Concentration,CD8, immunity, exposure, ammonia, chemicals, toxicity, rats, working environment*

INTRODUCTION

Ammonia is one of the hazardous chemicals that are often used in Indonesia. Many case reports caused by acute and chronic effects of ammonia exposure. According to Hutabarat study (2010)[11]. The Analysis of Ammonia and Chlorine Gas Impact to Lung Physiology of Factory Workers, in Rubber Gloves "X" in Medan obtained as follows: that the exposure of ammonia causes complaints of dry throat (80%), dry respiratory roads (73.3%), sore eyes (66.67%), nasal irritation and cough (53.3%), and fainting (6.67%) with the safe limits level of ammonia gas in the air according to Regulation of Ministry of Manpower and Transmigration No.13-2011. Test results showed that levels of air in the working environment is below the threshold,grade 0,05 ppm.

Another study results reported by Daud (2012)[4] about Risk Analysis of NH_3 and H_2S Exposure on Scavenging at Land fill Tamangapa Makassar. The results showed that the concentrations of NH_3 in the Land fill is 0.637mg/m^3 and the safe duration of the Scavenger to work at the Landfill is about 2.6 years.

Ammonia has an impact on the body's immune system. The results Goto (2003)[7] about Helicobacterpylori and gastric diseases pylori showed that the bacteria can metabolize starch and protein in to ammonia that cause inflammation of the stomach. The result of this study also found that the systemic IgA immune response is the large stand most important agent for the invasion of Helicobacterpylori.

Based on several cases and the results of studies on the effects of ammonia on human and workers, it is needed to measure back the threshold limits value (TLV) of ammonia, especially in the workplace. As is known, the TLV of NH_3 in Indonesia by Minister of Manpower

and Transmigration No: 1/1997; ISO 2005 is 25 ppm or 17 mg/m^3. This number is the same as those issued by the ACGIH and lower than issued by OSHA 50 ppm.

Conceptually, the TLV of a toxin in the workplace is directly proportional to the weight of the human body (Williams, 1985)[17]. The average weight of workers in Western countries is greater than the average weight of workers in Indonesia. Therefore, the TLV of ammonia in Indonesia should be lower than the TLV of ammonia in Western countries, including those issued by the ACGH and OSHA from America.

The objective of research was to analyze anatomical differences in CD8 expression of rats's lymphocytes cell lung in exposed group and control group; to determine the highest dose of ammonia without any effect on rat; to determine the safe dose of ammonia on workers or Safe Human Dose (SHD) are exposed to ammonia; to determine SLC of ammonia gas in the workplace.

MATERIAL AND METHOD

The research was conducted in three stages: the first stage is experimental study, stage II is observational study, and stage III is determination of the safe limit of ammonia gas concentration in workplace.

The research used the species of Rattusnorvegicus or the rats that free from ammonia exposure as research object. The rats came from Laboratory of Animals Faculty of Pharmacy, University of Airlangga. Rats were selected by its sex, the weight of the rats is between 138-142 g and aged 2-3 months (rat breeding). Maturity is expected to be relatively non- rodents will have a different weight.

Results of preliminary research : The lowest dose that had no effect on the rat is 0,004552 mg/kg (with concentration of **0,058159** mg/m^3),being the highest dose is the dose that has an effect in rats but not lethal rat is 0,045523 mg/kg (with concentration of **0,58159** mg/m^3). Between the 2 groups was made 5 variations of ammonia exposure with each multiple of 5, so that the variation of the concentration of ammonia in there search phase I is : control group (0,0000 mg/m^3, exposed group (I:0,087239; II:0,130858; III: 0,196287; IV:0,294439; V:,441645 (mg/m^3). Each group contained 4 rat tail. Required a total of 24 rat tails.

FINDINGS

a) The results of observations of rats age in the early stages of this research has been selected samples of rat aged 1.5 to 2 months. Because this study runs for 1.5 months then aged rats during the study ranged from 3 months - 3.5 months. There are no influence of the rats immunity by the age and sex, except there is a treatment do for the rats. Data age rat indicated that the age homogenity test on the exposed group and control group had homogeneous variance with significance level p (0.983) > α (0,05). The average age of rat was 105.2 days.

b) Results of weight measurements of rat

In animal studies using rats, in this study measured that the weight factor will be known to its development, because it is done by using animal testing to observe the immune response. Weight factors can affect the results of the research (30). For this purpose the weight of rats performed statistical tests to determine homogeneity. From the results of homogeneity test indicated that the weight of rats exposed and control groups have homogeneous variance with significance level p (0.701) > α (0,05). Average weight 140.50 g rats.

Measurement of independent variables

a) Concentration of ammonia gas

Accordance with ammonium hydroxide evaporation equation into ammonia gas, by knowing the concentration of NH_4OH in the work environment can be known concentrations of ammonia gas in the workplace after taking into account the temperature and pressure of the air at the site of exposure

Table 1. Ammonia gas concentrations per group

Groups	N	Concentration (mg/m^3)
Control	4	0,0000
Exposed: Concentration I	4	0,0872
Concentration II	4	0,1309
Concentration III	4	0,1962
Concentration IV	4	0,2944
Concentration V	4	0,4416

Sources: Primary Data (2013)

Table 1 above is the smallest concentration of ammonia gas in the control group without exposure to ammonia, the first group with the highest exposure to 0.0872 mg/m^3 and 0.4416 mg/m^{3}konentrasi exposure. The ammonia concentration obtained from NH_4OH solution. By using the formula NH_4OH conversion to ammonia concentrations of ammonia gas generated is in units of mg/L. Ammonia gas concentration in mg/L is then converted to ammonia gas concentration with units of mg/m^3 using the Ideal Gas Theorem after adjusting the temperature and pressure conditions at study sites in the Laboratory Animals Faculty of Pharmacy, University of Airlangga. For temperature, the results of temperature measurement by Airlangga University Lab of PH Department OHS UA obtained 29.6^{o}C. For air pressure, measured by PP BTKL Surabaya is 759 mmHg.

b) Measurement of respiratory rate of rat

Respiratory rate measurement results are listed in the rat following table.

Table 2.Rat Respiratory Rate

Groups	Number	Average respiration rate (L/hr)
Control	4	1,3750 ± 0,0000816
Exposed 1	4	1,3755 ± 0,0001633
Exposed 2	4	1,3809 ± 0,0001633
Exposed 3	4	1,3809 ± 0,0000816
Exposed 4	4	1,3657 ± 0,0000816
Exposed 5	4	1,3754 ± 0,0001633

Sources: Primary Data (2013)

Table 2 in the rat average breathing rate is the lowest in the group of rats exposed to 4 is 1.3657L/ hr while the tallest is a group of rats exposed to 2 and 3 is 1.3809L/ h.

c) Determination of ammonia gas concentration limit in safe work environment

The method used to determine the concentration of ammonia gas safety of workers in the workplace is a formulation method with the following steps (30):

a. Determine the highest dose of ammonia NOAEL or no effect on rat by using the formula:

$$\textbf{Dose} = \frac{(\alpha)(BR)(C)(t)}{(W)}\ (mg/kg)$$

α =% absorbed substances lungs, = 100% if not known.

BR = animal respiration rate (m^3/hr)

t = longer working time (hours)

C =concentration of toxins in the air (mg/m^3).

b. SHD determine safe human dose (mg/kg) with the formula:

$$\textbf{SHD= NOAEL}\ \frac{\textbf{(Animal Km)}}{\textbf{(Human Km)}}$$

Note: NOAEL = No Observed Adverse Effect Level

1. Animal Km = W/ BSA

BSA = 0.09 W 0.67

BSA = Body Surface Area

W = weight of rats (kg)

2. Human Km = W/ BSA

w = weight of human

h = height of human

c. Determine the safe limits of ammonia gas concentration in the working environment by using the following formula:

Safe Limits [NH3] = (SHD)(W) (mg/m^3)

(α)(BR)(t)

Safe Limits [NH_3] = #(mg/m^3)x(R.T) ppm

(P)(Mr.NH_3)

α =% NH3 is absorbed through the lungs If not known α = 100%)

BR = Breathing Rate = rate of respiration in workers (m^3/hr)

BR = [(Vrespd.td.VT) + (Vrespb.tb.VT) + (Vrespj.tj.VT)]:8

V resp = Speed respiration

td = number of hours of time to sit

tb = number of hours of time to stand

tj = the number of hours of time to run

t = td + tb + tj = 8 hours of work (hours)

VT = tidal volume lung

SHD = safe human dose (mg /kg)

R = Rydberg constant (0.082 L.atm/mol.°K.)

T = (273 + T°C)

P = air pressure (atm)

Mr = molecule relative

Measurement of the dependent variable

Based on data from the ammonia gas concentration in units of mg/m^3 above, can be determined dose of ammonia in the body of rats by using a conversion formula known concentration to dose after respiratory rate of rats, rats body weight and duration of exposure to ammonia in the rat. Long exposure to ammonia gas in the rat is 8 hours every day.

- Description of the average breathing rate of rat

Description of the average respiratory rate in the first phase of the study was 0.0013 m^3/hr.

- Description of the average weight of rats

Description of the average weight of rats in the study phase I.

Dose of ammonia in the body of rats in each group of by ammonia gas concentration, the percentage of ammonia is absorbed, the average breathing rate per group, the average weight per group and a long exposure on a daily basis are listed in.

Table 3. Calculated Dose ammonia in the body of the Old rat Exposure of 8 hours/day

NH_3 concentration (mg/m^3)	Percentage of ammonia is absorbed (α)	Average respiration rate (BR)(L/ hr)	W (average weight) (kg)	Dose NH_3(mg/ kg)
0,0000	100%	1,3750	0,1405	0,0000
0,0872	100%	1,3755	0.1405	0,0068
0,1309	100%	1,3809	0,1410	0.0103
0,1963	100%	1,3809	0, 1410	0,0154
0,2944	100%	1,3657	0.1395	0,0231
0,4416	100%	1,3754	0.1405	0,0346

Sources: Primary Data (2013)

Table 3 above is based on concentration data, the percentage of ammonia is absorbed, the average rate of respiration, prolonged exposure to ammonia every day and the weight of rats in each dose group it is known that ammonia is absorbed by each group of rats. Dose of ammonia in the control group was 0.0000 mg/kg, in group I was exposed to 0.0068 mg/ kg, in the exposed group II 0.0103 mg/ kg, in the exposed group III 0.0154 mg/ kg, in the exposed group IV 0.0231 mg/ kg and in group V 0.0346 mg/ kg body weight of rats.

Group

Based on the results of the calculation of the dose of ammonia in rat exposed group and control over, the lowest dose of ammonia in the body of a rat control group is 0,000 mg/kg body weight while the rat was on the highest dose group V rats exposed to ammonia is 0.0346 mg/ kg of body weight of rat.

Observations on the expression of CD8 lymphocytes

K represents the control group without exposure to ammonia, and 1, 2, 3, 4 and 5 respectively represent the group exposed to ammonia in a row with a dose of ammonia 0.0068; 0.0103; 0.0154; 0.0231; 0.0346 (mg/kg), it seems the number of cells immunoreaktif (arrows) increased both the number and intensity of the color began to control group exposed group 2 and 3 decreases ranging exposed group and lowest in the exposed group 5.

Table 4. Observations CD8 Expression on Rat Lung Cells Lymphocytes

Groups of	Dose NH_3 (mg/kg)	Ekspresi CD8
Control	0,0000	2,00
Group I	0,0068	4,00
Group II	0.0103	5,50
Group III	0,0154	6,75
Group IV	0,0231	4,00
Group V	0,0346	2,75

p = 0,042 ; α = 0,05

Sources: Primary Data (2013)

IRS calculation of CD8 as shown in Table 4 above the highest scores are those of CD8 IRS III (6.75) or at a dose of 0.0154. Of that number then decreased to 3.00 IRS. From these data it can be concluded that the location of the highest dose of ammonia with no effect on the lungs of rats were in group III, the dose of 0.0154 mg/ kg body weight of rat.

From the results of statistical analysis using the Kruskal Wallis test a significant difference between the number of CD8 IRS with a control group exposed group I, II exposure, exposure III, IV and exposed group V with significance p (0.042) <α (0,05).

From the above description it can be stated that the highest dose of ammonia without effect (NOAEL) in the rat lies in the exposed group III at a dose of 0.0154 mg/ kg body weight of rat.

Based on the findings of the value of the highest dose of ammonia with no effect on rat (0.0154mg/kg), Animal Km rats on average (with an average weight140.5g) is 5.81and the Human Km workers in the poultry industry average the average (mean weight 61.46 kg and mean height 158.7cm) is 37.34, using an extrapolation formula (30) safe dose of ammonia to workers or safe Human dose (SHD) is 0.0154x5.81/37.34=0.0024 mg/kg body weight of workers.

CONCLUSION

The safe limit of ammonia gas concentrations findings from this study is different significantly with ammonia NAB issued by ACGIH and NIOSH (USA), which is often the branchmark of Indonesian government in determining NAB. This is not the same difference in the determination of the NOAEL, physical condition (weight and height), temperature and air pressure in Indonesia and in Western countries.

There was significant differences in CD8 with p = 0.042 <α (0.05) in the lungs of rats axposed to ammonia and control groups.Highest dose of ammonia without effect in rats, is mentioned as NOAEL was 0.0154 mg/ kg rat body.Based on this research, Animal Km rat factor average (with an average weight 140.5 g) is 5.81, Km Human factors of poultry industry workers in the average (mean weight 61.46 kg and average height 158.7 cm) is 37.34. Extrapolation factor is Animal Km factordevided with Human Km factor. The results obtained NOAEL was a safe dose of ammonia to the worker/safe human dose (SHD) exposed to ammonia is 0.0024 mg/kg body weight workers.

Conflicts of Interest: All authors have no conflicts of interest to declare.

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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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Mothers Knowledge on Malnutrition: Community based Cross Sectional Study

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ABSTRACT

Malnutrition is the major cause of many diseases and is a burden in developing countries. A child's intake can have a great impact on her/his growth and development. The mothers' knowledge on nutrition can play a vital role in child's intake to improve nutritional status. **Objective:** To assess the knowledge of mothers of preschool children regarding malnutrition and its management. **Methodology**: A cross sectional descriptive study was conducted among mothers of preschool children. Five hundred and seventy mothers were selected randomly from 15 villages of Udupi Taluk. Pre-tested, structured knowledge questionnaire was used to collect the data. The level of knowledge was determined by pre-defined score. **Results:** Majority (31.8%) of the mothers' educational qualification was lower primary and 32.6% of them have completed high school. Majority (83.0%) of the mothers belonged to poor socio-economic status, 16.0% were from middle socio-economic status and 1.0% were from Below Poverty Line (BPL) family. About 65.44% of mothers were having average knowledge about malnutrition, 31.58% of mothers had poor knowledge and only 1.0% were having good knowledge. **Conclusion:** This reiterates the need for education to improve knowledge on malnutrition among the mothers.

Keywords*: Malnutrition, mothers' knowledge, mothers' educational status, child, nutritional status*

INTRODUCTION

Malnutrition in all its form remains a major public health problem throughout the developing world. The prevalence of underweight among children in India is the highest in the world, and nearly double than that of Sub-Saharan Africa. Child malnutrition is responsible for 22% of India's burden of disease[1]. National Family Health Survey -4 (2015-16) reported that, 36.2% of children under age five are stunted, or too short for their age, 26.1% of children are too thin for their height and 45.7% are underweight in Karnataka[2]. District Family Health Survey-4 (2015- 16) reported that 21.1% of children under age five are stunted, 20.9% of children are wasted, or too thin for their height and 26.3% are underweight in Udupi district[3].

Under nutrition or malnutrition directly affects many aspects of children's development. In particular, it retards their physical and cognitive growth and increases susceptibility to infection, further increasing the probability of malnutrition. Under nutrition affects educational attainment and productivity, with adverse implications on income and economic growth[1].

Promoting good nutrition and dietary habits is one of the important components of maintaining a child's health. The mother is the principal provider of the primary care that her child needs during the first six years of his/her life. The type of care she provides depends to a large extent on her knowledge and understanding of the aspects of basic nutrition and health care[4]. The

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knowledge regarding malnutrition is important for a mother.

Objective:

To assess the knowledge of the mothers of preschool children regarding malnutrition and its management

METHOD AND MATERIALS

A community based cross sectional survey was carried out in Udupi Taluk, Karnataka to assess the knowledge of the mothers of preschool children regarding malnutrition. Fifteen villages were selected from Udupi Taluk using simple random sampling technique. Initially cluster of 93 Anganawadi centres were selected from 15 villages and 570 mothers of preschool children were selected from these Anganawadi centres.

Validated questionnaires were used for data gathering. Background information was collected using demographic proforma. O.P Aggarwal's Socio economic status scale (2005)[5] was used to assess the socio-economic status of the family. Structured knowledge questionnaire on malnutrition and its management was used to assess the mothers' knowledge. It contained 24 questions in relation to meaning, causes, symptoms, treatment, control, prevention and complications of malnutrition. The reliability of the scale was established by administering the tool to 20 mothers using split half method.and found to be reliable (r=0.92). This study was approved by the Institutional Ethical Committee (IEC) and administrative permission to conduct the study was obtained from concerned authority. Visited Anganawadi centres to identify the preschool children and interviewed 570 mothers of preschool children to obtain information on socio-economic status and knowledge about malnutrition and its management after obtaining written informed consent. Data were analysed with Statistical Package for Social Sciences (SPSS) version 16.

RESULTS

Demographic characteristics of the study population

A total of 570 mothers of preschool children were included in this study and the sample characteristics are presented in Table 1.

Table 1: Demographic characteristics of the study population N = 570

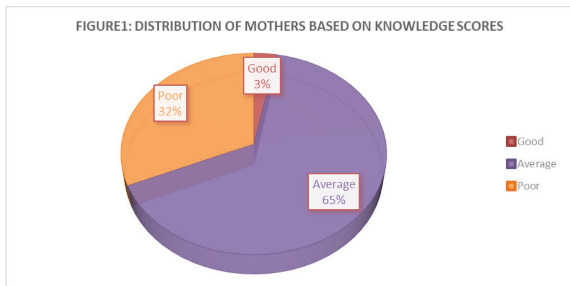
Demographic characteristics	Frequency	Percentage
Educational status		
Illiterate	19	3.3
Lower Primary	181	31.8
Upper primary	45	7.9
High school	186	32.6
P U C	94	16.5
Graduation and above	45	7.9
Religion		
Hindu	533	93.51
Christian	11	1.93
Muslim	26	4.56
Type of family		
Nuclear	324	56.84
Joint/Extended	246	43.16
Socio-economic status		
Middle	91	16.0
Poor	473	83.0
BPL	6	1.0

The data presented in Table 1 shows that, majority, i.e. 186 (32.6%) of the mothers completed high school education and 181 (31.8%) mothers had lower primary education. Majority, i.e. 473 (83.0%) mothers belonged to poor socio-economic status, and 9 (1.0%) were from BPL family. It indicates that, most of the respondents were from poor socio-economic status.

Table 2: Mothers' Knowledge level on malnutrition and its management N=570

Variable	Minimum score	Maximum score	Mean	SD
Mother's knowledge score	**3.00**	**19.00**	**10.54**	**±3.54**

The data presented in table 2 shows that, mean knowledge score of mothers' was 10.54 with SD of 3.54 which indicates that overall knowledge among mothers' on malnutrition was less than 50 %.



Knowledge score was categorised arbitrarily with score range as poor knowledge (0-8), average knowledge (9-16) and good knowledge (17-24) and is presented in figure 1.

The data presented in figure 1 shows that highest percentage (65%) of the mothers were having average knowledge and only 2.98% of mothers were having good knowledge on malnutrition and its management.

Table 3: Item wise knowledge among mothers' on malnutrition and its management N=570

Items	Knowledge			
	Correct response		Incorrect response	
	f	%	f	%
Imbalanced diet is the cause of malnutrition	221	38.8	349	61.2
Less weight for age as a clinical feature of under nutrition	442	77.5	128	22.5
Every three months height and weight must be checked for children aged 3 – 5 years	314	55.1	256	44.9
Cereals, pulses, milk, fish and green leafy vegetables are essential for growth of the children	439	77	131	22
Within half an hour of delivery breast feeding should be initiated	495	86.8	75	13.2
By six months of age supplementary feeding should be initiated	63	11.1	507	88.9
Child should be hospitalized to treat severe malnourishment	144	25.3	426	74.3
Delayed physical growth and impaired cognitive development are the complications of malnutrition	243	42.6	327	57.4
Adequate breast feeding, nutritious food and regular deworming will prevent the malnutrition in children	228	40	342	60
Immunization is the best way to protect the child against infectious diseases	466	81.8	104	18.2

Table 3 shows that, 38.8% mothers knew that, imbalanced diet is the cause of malnutrition. More than 70% of mothers were aware about clinical features of malnutrition and essential foods for growth of the children. Only 55% of the mothers were aware that every three months height and weight must be checked for children aged 3 – 5 years. More than 86% of mothers' were aware that breast feeding should be initiated within half an hour of delivery but 88.9% of the mothers were not aware when to initiate the supplementary feeding to the child. Majority, i.e. 74.3% of the mothers did not know about the action to be taken when child is severely malnourished and 57.4% mothers did not know the complications of malnutrition. Most of the (60%) mothers are not aware about how to prevent malnutrition and 81.8% mothers knew that the immunization has important role in protecting the child against infectious disease.

DISCUSSION

In this study, 32.6% of the mothers completed high school education, 31.8% mothers had lower primary

education, and 3.3% were illiterate. A study conducted in Dhaka city, Bangladesh, by Hoque et al.,[6] reported that 15 % of mothers had education till secondary school, 19% had lower primary and 22% were illiterate. Divya et al.,[7] found 24% mothers had Secondary education, 12% primary education and 8% were illiterates in a study conducted in Mangaluru, India. Kavitha et al.,[8] found that 53% mothers had primary education in a study conducted Salem, India . Parental literacy i.e. mothers' education level had an impact on child's malnutrition in India reported by Worley[8.] Various studies have reported that the education of women plays a central role in improving the health of children[(,10,11,12,13)].

In the present study 65.44% of the mothers had average level of knowledge and 31.58% had poor knowledge on malnutrition and its management which indicates that, mothers' knowledge on malnutrition was less than 50 %. Similar findings reported by Kavitha et al.[8] also reveal that 46.6% of the mothers had average knowledge, 36.6% poor knowledge and 16.6% good knowledge in Salem, India. Kaur et al.[14] found that 52.5% mothers had medium level of knowledge. A study conducted in Mysore by Kulsum et. al.,[15] found 55% mothers had moderate knowledge followed by 13.5% who had low knowledge. Various studies showed an association between the mothers knowledge and children's nutritional status[(11,12,13)].

It is evident from this study that 61.2% of the mothers were not aware about various causes of malnutrition but fair number (55%) of mothers have knowledge about when to take their child for height and weight checking. If mothers do not have adequate knowledge on nutritious food there will be imbalance or inadequate diet intake by the child and it affects the nutritional status of the child.

Regarding knowledge on infant feeding, 86.8% mothers expressed that within half an hour of delivery the mother should initiate breast feeding and 65.4% mothers expressed continued breast feeding should be given till one and half years for the child. The study by Kaur et al[14] reported that, 67.5% of mothers were aware about the initiation of breast feeding within one hour of birth and duration of breast feeding up to two years (46.7%), Only 11.1% of mothers in this study had correct knowledge about the ideal age of introduction of supplementary feeding but a study by Kulsum et al[15] reported, 59% of mothers gave an appropriate answer when asked about the ideal age for introduction of supplementary feeding. Hoque et al[6] found that about half of the respondents had knowledge on mixed food and consequences of malnutrition. Nayak[16] reported that 38.8% knew the proper age of complementary feeding. Chatterjee & Saha[17] reported that in 14.54% of children, breast feeding was initiated within one hour of birth and 42 % mothers initiated breast feeding after 24 hrs. It reveals that mothers had higher percentage of awareness about ideal time of breast feeding initiation in our study than other studies. It was observed that, mothers' awareness about initiation of supplementary feeding was lacking in all the studies. So it is very important to make all mothers aware about complimentary feeding through education programme.

Higher percentage i.e. 74.3% of mothers were unaware about treatment for malnutrition, 57.4% unaware about complications of malnutrition, 60% mothers had less knowledge on prevention of malnutrition and 72.8% of mothers did not know about risk factors of malnutrition. Comprehensive knowledge on malnutrition and its management need to be imparted to mothers.

CONCLUSION

Knowledge on types of food which are required for growth and development for the children was very poor. The study revealed that the mothers' knowledge on nutritious diet needs to be improved. If mothers have sufficient knowledge on nutrition and malnutrition prevention, it is effective in improving the nutritional status of their children. The study implies that, it is very essential that every woman in rural India needs to have knowledge on nutrition which builds up strong and healthy citizens for the support and development of a country.

Limitation

The study was limited to the mothers of preschool children who are attending Anganawadi centres.

Conflict of Interest: The authors declare that they have no conflicts of interest

Source of Funding: Nil

Ethical Clearance: Study was approved by Institutional Ethics Committee.

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Correlation of Atherogenic Indices and IMA with Glycaemic Control in Diabetic Patients with and without Dyslipidemia

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ABSTRACT

Atherosclerosis is one of the most common major complications associated with type 2 diabetes mellitus. Recent research suggests that the major culprits are modified proteins like LDL and albumin. Hence, this study focuses on the analysis of small dense LDL (sd LDL), oxidised LDL (ox LDL) and ischemia modified albumin (IMA) in type 2 diabetes mellitus patients with and without dyslipidemia and compare with healthy subjects. Further, correlate atherogenic indices (ox LDL/HDL and sdLDL/HDL) with glycated haemoglobin in these groups. 90 subjects aged between 30-60 years of both the genders were divided into 3 groups namely diabetic dyslipidemia (Group1), diabetic non dyslipidemia (Group2) and normal (group3). Serum lipid profile, ox LDL and IMA were estimated by spectrophotometric methods, sd LDL by calculation and glycated Hb by HPLC. Ox LDL showed an apparent increase in diabetics (group 1and 2) compared to normal. Though sd LDL levels in diabetic patients remained normal, the values doubled in dyslipidemic diabetics. sd LDL/HDL ratio was significantly high in both group1and 2 compared to normal. Furthermore, there was a significant positive correlation of this ratio with glycated Hb in both groups of diabetes. Serum IMA also increased significantly in diabetes with dyslipidemia compared to non dyslipidemic diabetics.

The study highlights the fact that in diabetics, oxidatively modified proteins like LDL and albumin may increase with hyperglycemia even before dyslipidemia sets in. Hence, ox LDL and sd LDL may be included in the battery of extended lipid profile to monitor cardiovascular complications in diabetes.

Keywords: *sd LDL, Ox LDL, Dyslipidemia, IMA, Glycated Hemoglobin, Type 2 Diabetes mellitus*

INTRODUCTION

Type 2 diabetes mellitus is a common metabolic disorder impinging on the health and life span of the affected individuals. Though dyslipidemia is an associated feature in most of the diabetics, recent research has proved that, in most of the dyslipidemic cases, total plasma LDL cholesterol may appear to be normal, with a rise in the levels of the real culprits, namely small dense LDL, a sub fraction of LDL and oxidized LDL, a powerful tool in the assessment of oxidative stress. These changes in the pattern of lipid profile may be secondary to insulin resistance seen in diabetes mellitus. [1] Cardiovascular diseases, one of the major consequences of diabetes mellitus, results due to atherosclerosis. Initial process that results in cardiac damage is attributed to ischemia of the cardiac tissue. [2] It has been reported that albumin can get modified at its N terminus during ischemia of tissues, particularly cardiac tissue, to form a product named as ischemia modified albumin. [3]

AIM

This study focuses on the analysis of plasma levels of small dense LDL, oxidized LDL and IMA in type 2 diabetic patients, diabetic dyslipidemic patients and normal controls, correlate the atherogenic indices (oxidized LDL/HDL and sdLDL/HDL) and IMA with glycated hemoglobin in the above groups and to

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determine the index that is most useful in assessing the risk of CVD in these groups.

MATERIALS AND METHOD

Blood samples were collected from 90 patients aged between 30- 60 years of both sexes, and were grouped as:

Group1: Diabetic dyslipidemia**:** (n=30) Persons who have abnormal lipid profile values & glycated Hb > 6.5.

Group2: Diabetes without dyslipidemia**:** (n=30) Persons having glycated Hb > 6.5 and normal lipid profile.

Group3: Normal Healthy controls**:** (n=30) Individuals having lipid profile values & glycated hemoglobin in the normal range

Exclusion criteria: Smokers, alcoholics, patients with systemic illness and patients on hypolipidemic drugs were excluded from the study.HbA1c was estimated by HPLC method [4] using EDTA blood. All other estimations were done using serum sample. Lipid profile was measured by spectrophotometric methods using fully automatic analyzer Roche PE modular. [5] LDL estimation was done both by direct(c LDL) and indirect (dLDL) methods. Oxidised LDL was estimated by simple precipitation method, [6] IMA by cobalt albumin binding assay, [7] and sdLDL was calculated from lipid profile data using formula proposed by Sriwasdi P et.al. [8] sdLDL- C(mg/dl)=0.580(non HDL-C) +0.407(dLDL-C)-0.719(c LDL-C)-12.05

Statistical analysis:

Statistical analysis was done using software SPSS20. ANOVA Post HocTukeys test was used for intergroup comparison of data. Pearson's correlation coefficient was used to study correlation of atherogenic indices with glycated Hb. 'p' value of <0.05 was considered as significant

RESULTS

Fasting plasma glucose and glycated Hb was significantly elevated in dyslipidemic group, compared to diabetic group. Serum triglycerides, VLDL, LDL increased significantly in diabetic dyslipidemic patients compared to both diabetic and control groups. However, diabetic group did not show any change in these lipid levels compared to normal. Oxidised LDL and ox LDL/HDL showed apparent increase in both diabetic group and dyslipidemic group compared to normal. Furthermore, sdLDL in diabetics showed a mild increase compared to control but it doubled in dyslipidemic. Increase in sdLDL/HDL was statistically significant both in diabetic group and dyslipidemic group compared to normal. The ratio almost increased three times in dyslipidemic group compared to diabetic patients. Serum IMA level was significantly elevated in dyslipidemic group compared to diabetic group. Interestingly, the IMA level in normal was also significantly high compared to diabetics (Table 1). Correlation of atherogenic indices with glycated Hb in the three groups did not show any significance, except that there was a significant positive correlation of sdLDL/HDL with glycated Hb in diabetes patients(r=0.361, p=0.042). However, there was a negative correlation of IMA with glycated Hb in diabetics and dyslipidemic patients (Table 2).

Table1: Comparison of glycated Hb, Lipid profile, IMA and atherogenic indices in, dyslipidemic diabetes, diabetes and normal

	Group I (n=30)	Group II (n=30)	Group III (n=30)
Age	51.63±7.6	47.47±6.6	48.7±6
FPG(mg/dL)	147.4±42.5^{c}	162.7±68.1^{c}	91±5.3
HbA_{1C}(g/dL)	7.8±1.2^{c}	8.2±1.88^{c}	5.56±0.34
TC(mg/dL)	223.6±33.4^{b,c}	143.6±29.2^{a,c}	165±24
TG(mg/dL)	193±77.6^{b,c}	104.1±25.4^{a}	99±24
HDL(mg/dL)	38.8±11.9^{b,c}	44.8±8.1^{a}	45±5
dLDL(mg/dL)	149.8±45^{b,c}	83±14.8^{a}	89.4±12.1
VLDL(mg/dL)	41.4±16.4^{b,c}	28.3±14.1^{a}	27.2±8.8
IMA(U/L)	0.917±0.33^{b}	0.665±0.213^{a,c}	0.865±0.309

Cont... Table1: Comparison of glycated Hb, Lipid profile, IMA and atherogenic indices in, dyslipidemic diabetes, diabetes and normal

oxLDL(mg/dL)	0.0375±0.032	0.03655±0.035	0.0292±0.02
Non HDL(mg/dL)	184.75±37.1[b,c]	98.7±26.4[a,c]	120.7±23.5
oxLDL/HDL	0.000987±0.0008	0.000825±0.000727	0.000654±0.00047
sdLDL/HDL	1.41±0.58[b,c]	0.525±0.16[a]	0.492±0.12
CLDL(mg/dL)	146.1±36.3[b,c]	77.9±26.4[a,c]	100±23.7
sdLDL(mg/dL)	51.03±17.6[b,c]	22.9±6.24[a]	21.8±4.6

(a corresponds to $p< 0.05$ comparing with group I,

b corresponds to $p< 0.05$ comparing with group II,

c corresponds to $p< 0.05$ comparing with group III)

Table 2: Correlation of IMA, Atherogenic indices with HbA1C in three groups.

	Group I		Group II		Group III	
	r	p	r	p	r	p
oxLDL/HDL	-0.098	0.6	0.057	0.763	-0.024	0.89
sdLDL/HDL	0.236	0.21	0.374*	0.042	0.087	0.648
IMA	-0.41	0.831	-0.212	0.26	0.267	0.154

*statistically significant

DISCUSSION

Cardiovascular diseases, one of the major consequences of diabetes mellitus, results due to atherosclerosis. Initial process that results in cardiac damage is attributed to ischemia of the cardiac tissue. IMA can be considered as a biochemical byproduct of albumin that may participate in acute phase reaction induced by vascular injury. [9] IMA has been a promising marker for evaluation of ischemic events in diseases like stroke, end stage renal diseases, liver cirrhosis and peripheral vascular diseases. [10] The results of our study shows that IMA levels did not alter in diabetes compared to normal individuals. However, earlier studies have reported increased serum IMA in diabetics and in patients with chronic microvascular complications. [11] Shaogang et al [12] also observed elevated IMA in patients with diabetic ketosis and in type 2 diabetes. In our study, diabetic patients with dyslipidemia showed marked increase in IMA compared to patients without dyslipidemia. In diabetes mellitus inflammation and increased free radical production decreases iron binding capacity of albumin leading to elevated IMA. Furthermore, correlation study revealed that IMA increased with glycated Hb only in diabetic dyslipidemic patients probably underlining the complications associated with dyslipidemia in diabetes.

Though characteristic dyslipidemia in diabetes mellitus includes increased VLDL and decreased HDL, qualitatively altered LDL which becomes small and dense and which readily gets oxidized becomes more atherogenic. These particles being not recognized by LDL receptors will be taken up by macrophages getting transformed to foam cells. [13] The results of our study also proves the above fact that even in diabetic patients with normal LDL, oxidized LDL is high, almost nearing the values of dyslipidemic diabetics. Kiranmayi et al [14] have demonstrated rise in oxidized LDL in DM patients compared to normal individuals. Due to hyperglycemia in DM, there is glycation and oxidation of LDL, hence oxidized LDL can be considered as the indicator of both insulin resistance and atherosclerosis .Concentration of LDL do not alter much in DM patients compared to nondiabetic individuals. [15] Our results are in agreement with this finding which suggests that LDL has been modified to oxidized LDL or sdLDL in diabetes mellitus. Individuals having lipoprotein profile with high oxidized LDL and high sdLDL have 4 times greater risk

of developing cardiovascular diseases.[16] Atherogenicity of LDL can be enhanced by nonenzymatic glycation of LDL which increases its lifespan. [17] Our results show that in normal subjects sd LDL is 22% of total LDL, whereas those with Diabetic dyslipidemia had 30%.This is in accordance with earlier studies on both hyperlipidemic animals and humans. [18] In the present study we observed that sdLDL doubled in dyslipidemic diabetics compared to diabetics emphasizing the fact that sd LDL is a better atherogenic indicator.

Glycation and oxidation of proteins and enzymes associated with HDL renders it nonfunctional and pro inflammatory in DM which by itself is an inflammatory condition.[19] Decreased paraoxanase activity in DM patients lowers protective action of HDL against LDL oxidation further contributing to acceleration of atherosclerosis.[20] HDL level in diabetics were lower than those of nondiabetics.[21] The results of the present study also confirms this observation with dyslipidemic diabetics showing significant decrease in HDL and significant increase in LDL compared to healthy subjects. Non HDL cholesterol is an index of all atherogenic apolipoprotein B containing lipoproteins like LDL, VLDL and lipoprotein (a). There is evidence which suggests that in DM patients non HDL cholesterol is a stronger predictor of mortality from Coronary Heart Disease than LDL. [22] Our results confirms the above findings, where non HDL doubled in dyslipidemic group compared to diabetic group.

Our study depicts that atherogenic indices namely, ox LDL/HDL and sdLDL/HDL increased significantly in diabetes patients with normal lipid profile compared to healthy subjects, highlighting the importance of estimation of oxidized LDL and sdLDL along with other lipid profile parameters in diabetics even before dyslipidemia sets in. Glycated hemoglobin showed a significant positive correlation with sdLDL/HDL in diabetes patients with normal lipid profile. Higher levels of IMA observed in our study in normal subjects compared to diabetics, warrants further research.

CONCLUSION

On the whole, it can be concluded that OxdLDL/HDL and sdLDL/HDL maybe considered as better atherogenic markers in type 2 diabetes patients than LDL or HDL.

Conflict of Interest: The authors declare that there is no potential conflict of interest.

This project has been approved by Institutional Ethical Committee.

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Factor Related to Urine Trans, Trans-muconic Acid (TT-MA) Levels of Shoemaker in Tambak Oso Wilangun Surabaya

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ABSTRACT

Benzene is one of the components contained in the glue which is used in shoe-making process of home industry activities. The using of Benzene in a long period can cause hematologic disorders. The exposure of benzene in the working environment of the shoemaker is related to the individual characteristics and the conditions of the working environment. The level of trans, trans muconic acid (tt-MA) in the urine is a manifestation of a research subject's exposure to benzene exposure in the workplace.

The purpose of this study was to analyze factors related to urine tt-MA levels of shoemaker. This study was an observational research, and the design of study is a cross-sectional research with 20 people as the research subjects. The independent variables were age, gender, nutritional status, working hours (hour/ day), working periods (year) and smoking habit, whereas the dependent variable was urine tt-MA levels.

The mean of benzene level in the air is 0.5111 ppm and the mean of urine tt-MA levels is 555,65 μg/ g creatinine. Pearson correlation test indicated that there is a significant relationship between the working hours (hour/ day) with the urine tt-MA levels of the research subjects (p= 0.040).

Continuous counseling needs to be carried out considering the risks of chemical substances in the home industry of shoes. In addition, the application of the regulation of 5R principles in the workplace is necessary, and maintaining personal hygiene and expanding ventilation as well as providing plantation to reduce the benzene vapor in the working environment of the shoemaker is important.

Keywords **:** *Glue, Benzene, Shoemaker, Urine trans, trans-muconic acid (tt-ma) levels*

INTRODUCTION

One of informal sector which gives a strong influence in the development of Indonesia is the home industry of footwear with a total value of $ 1.51 millions. The characteristics of footwear informal industry is that this industry is very vulnerable to the hazards of chemical elements[1]. Generally, glues or adhesives contain various combination of chemical elements including benzene which has function as a solvent.

Benzene is a hazardous chemical element and it is carcinogenic to human[2]. The most significant toxic effects upon exposure to benzene is bone marrow damage[3]. Related research of biochemical and hematological analysis on the shoemaker in Pakistan found that there is a significant result of changes in the levels of blood profile of the shoemaker workers compared to the control group [4].

Benzene that enters the body will undergo metabolism into benzene epoxide. Benzene epoxide is an unstable compound and it will undergo oxidation to form trans, trans-muconaldehyde then turn into trans, trans Muconic Acid which is excreted in the urine. One of sensitive and relevant indicators to measure the exposure and dosage of benzene entering the body is by using a biomarker which is trans, trans Muconic Acid (t, t-MA) contained in the urine[5]. The level of tt-MA in the urine will be able to detect the exposure of benzene at concentrations of up to 0.1 ppm[6].

The amount of benzene entering the body of the shoemaker can not be separated from the related characteristics of the individual and their working environment. Age affects the body resistance to toxic exposure, the older the worker, the higher the risk of benzene poisoning[7]. Gender also related with the

susceptibility of benzene toxicity which is lipophilic in which women have more body fat than men[8]. Working hours (hours/ day), working periods (year) is closely related to the large exposure to the hazardous substances and the onset of disease if it exceeds within the specified limits[9]. Nutritional status is also an important factor in the process of health risk analysis, if the nutritional status of workers are within the normal level, the process of blood cell formation will goes normal[10]. Smoking habits will increase the amount of benzene intake, benzene in cigarette smoke is around 25.5 to 63.7 g/ stick of cigarette[11].

Indonesia sets a Threshold Limit Value (TLV) for benzene of 0.5 ppm which is according to the regulation[12]. The Biological Exposure Indices at work on the exposure of benzene fro the biomarker of tt-MA biomarkers in urine is at 500 ug/ g creatinine[6].

The results of observations on the shoemaker in the home industry of Tambak Oso Wilangun Surabaya indicated some characteristics, such as unhealthy working environment, bad ventilation, no PPE (mask), the glue container used is always open, the workers also do not wear clothes and smoking at work. The workers seem to have complaints such as dizziness, shortness of breath and stinging in the eyes, which indicates that their bodies have been expose to benzene.

The purpose of this study was to analyze the relationship of the research subjects characteristics including age, sex, nutritional status, working hour (hours/ day), working period (years) and smoking habits with the levels of urine tt-MA.

MATERIAL AND METHOD

This study applied a cross sectional design with an obeservational type, obtained 20 people as the subjects selected based on certain criteria. The research was conducted in 7 home industries of footwear in Tambak Oso Wilangun Surabaya, held in November 2016. To determine the level of benzene exposure in the body of the shoemaker was done measurement of biomarker of urine tt-MA, and to determine the levels of benzene in the working environment was done benzene measurements in the air.

This study applied some research instruments such as questionnaire, observation sheets and interview notes. All the subjects was given instruction and completed the informed consent prior to the measurement.

FINDINGS

The characteristics of subjects in this study can be seen in the following table 1:

Tabel 1. Subject characteristics

No	Variable	Category	Result	
			n	%
1	Age (years)	min (23)	-	-
		max (62)	-	-
		mean (46,05)	-	-
2	Sex	male	10	50
		female	10	50
3	Nutritional Status (BMI)	thin (<18.5)	1	5
		normal(18.5-22.9)	4	20
		fat (> 22.9)	15	75
4	Working Hours (hours/day)	min (6)	-	-
		max (15)	-	-
		mean (11,08)	-	-
5	Working Periods (years)	min (2,5)	-	-
		max (43)	-	-
		mean (25,7)	-	-
6	Smoking habit	Smoker	7	35
		Not smoker	13	65

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

In collecting the data of the characteristics of the subjects was done by interviewing the respondents by using a questionnaire which consists of age, sex, working hours and working periods and smoking habit. Whereas to collect the data of nutritional status was done by using the indicator measurements of Body Mass Index (BMI), the data of height and weight.

The measurement of environment was conducted to determine the level of benzene exposed in the working environment. The results of measurements of the level of benzene in the air can be seen in the following table 2:

Table 2. The Level of Benzene in the Air

Work Location	Point (Floor)	Result: Level of Benzene (ppm)
Location A	1	0,3975
Location B	2	0,0129
Location C	3	0,3503
Location D	4	0,0193
Location E	5 (1st floor)	0,9129*
Location F	6 (2nd floor)	2,3330*
	7	0,0182
Location G	8	0,0485
mean		0,5111
max		2,3330
min		0,0129

* Exceeding TVL levels[12]

The mean of benzene level in the air of home industry working environment is 0.5111 ppm with the highest levels at 2.3330 and the lowest level at 0.0129 ppm ppm.

The chemicals occur in their working environment, which is particularly derived from the glue may effects the physical health such as blood level abnormality. The different levels of benzene occur in each working location is caused by several things, they are: the number of shoes produced in the production, the type of raw materials used for the shoes, the technique/ methods of work, and the lack of sufficient ventilation.

In addition, a biomarker measurement of urine tt-MA levels to determine the level of benzene exposed in the body on the benzene exposed in the working environment. The result of measurement of tt-MA level in the research subjects can be seen in the following table 3:

Tabel 3. The level of tt-MA in the Subjects

Work Location	Point	Shoemaker	Level of tt-MA (*µg/g creatinine*)
Location A	1	*a*	466,71
		b	244,86
		c	247,93
		d	421,66
Location B	2	*e*	152,53
		f	327,50
		g	698,62*

Cont... Tabel 3. The level of tt-MA in the Subjects

Work Location	Point	Shoemaker	Level of tt-MA (*µg/g creatinine*)
Location C	3	*h*	417,17
		i	577,48*
		j	250,63
Location D	4	*k*	960,29*
		l	874,07*
Location E	5 (1st floor)	*m*	388,42
	6 (2nd floor)	*n*	1.731,38*
		o	775,08*
Location F	7	*p*	1.363,66*
		q	552,49*
		r	286,86
Location E	8	*s*	57,59
		t	296,12
mean			555,65
max			1.731,38
min			57,59
*Exceeding Biological Exposure Indices (BEI)[6]			

The urine test was done at the end of the working shift since it is a gold period of the peak accumulation of metabolites tt-MA[5]. The mean of urine tt-MA levels is 555,65 µg/g creatinine, there are eight respondents who had higher levels of tt-MA exceed the limit of BEI.

Statistical test analysis was done to determine the relationship of subject characteristics with the levels of urine tt-MA. To determine the relationship, variables with data ratio scale was analyze by using Pearson Correlation test. Whereas, variables with ordinal data scale was analyze by using Spearman correlation test. Besides, the nominal variable (sex) was analyzed by using t-test to find out the difference of tt-MA levels between male and female. The results of the test on the relationship of those variables can be seen in the following table 4.

Tabel 4. The Test Result of The Relationship

of the Subjects Characteristics with the Urine tt-MA Levels

No	Variables	p- value	Result
1	Age	0,965	Insignificant
2	Sex	0,896	Insignificant
3	Nutritional status (BMI)	0,492	Insignificant
4	Working Hours (hours/day)	0,040	Significant
5	Working Periods (years)	0,927	Insignificant
6	Smoking habit	0,064	Insignificant
(α = 0,05)			

Table 4 shows that there is a significant relationship between the variable of working hours (hours/day) with the level of urine tt-MA in the subject with a value of p = <0.05.

Age

The high levels of urine tt-MA of individuals is considered as the tendency of the factor of age that affects the decreased function of the body's metabolism (> 45 years old)[13]. However, the result of this study indicated that high levels of tt-MA also found in the subjects at the age of < 45 years old. In accordance with the research by Fakhrinnur *et al,* (2016)[14], also concluded that the variable of age is not dominant in relation to the levels of tt-MA since respondents at the age of < 45 years also consider to have high levels of tt-MA, therefore, the variable of age has no relationship with the levels of urine tt-MA in the respondents.

Sex

There is no difference in the levels of urine tt-MA between male and female. The results of the level of urine tt-MA of the subjects determined by gender are relatively similar. Liver has function as the metabolism of benzene and tt -MA in the subjects which is not discover in this study. Therefore, this is considered as the limitation in this study, since the liver function will affect the metabolism of a chemical substance[2].

Nutritional Status

Based on the results of body mass index measurements, obtained the mean of BMI is 27.13 or overall subject categorized as fat. This study does not similar with the research conducted by Waritz (1995)[15] who states that obesity may decrease the elimination rate of lipophilic subtance (benzene) in the liver. The result of this study indicated no relationship between the two variables since the nutritional status of the subjects cannot represent the overall nutritional history during the previous period, whereas benzene poisoning occurs chronically and accumulative, which then influenced by the nutritional history of the individuals[14].

Working Hours (hour/hari)

The result of this study indicated that working hours has a significant relationship with the level of urine tt-MA. To extend the working hours per day can increase the exposure to the chemical subtances in the working place[9]. The results of this study is supported by the research conducted by Mansour et al, (2012)[16] conducted in the footwear industry in East Tehran, adding the working hours will directly proportional with the amount of chemicals subtance (glue) usage in the production process result in the increase of severity of benzene exposed in the body. The duration of workers exposed to the chemical subtances in a matter of hours per day has a relationship with the levels of benzene in the urine of the workers themselves[17].

Working Period (year)

Working period does not have a relationship with the levels of urine tt-MA. Working period of more than 30 years is considered as the period effect of non-carcinogenic toxicant subtances which can be manifested in the human[18]. However, it was found in the research subject that the level of tt-MA is higher than the level of BEI with the tenure of >30 years, meanwhile, the working hours per day is more than 8 hours. This means that the working hours per day has a more significant relationship with the level of tt-MA compared to tenure. This also indicated that the excretion of tt-MA in the urine is at culmination after 4-5 hours exposure, therefore, the urine sample should be collected soon after the exposure happen[5].

Smoking Habit

In this study, smoking does not have a relationship with the level of urine tt-MA. The results of this study is in accordance with the research conducted by Martin *et al*, (2004)[19] concerning the level of urine tt-MA of worker with high exposure of benzene, there is no significant difference between workers who have smoking habit and those who do not have smoking habit.

This study recommends that the should government undertake continuous health education, and for the shoes craftsmen shoes to optimize ventilation and maintain personal hygiene. For the next researcher to use personal sampler tools to determine the level of exposure of each individual received.

CONCLUSION

1. The mean of benzene levels in the air of the home industry working environment is at 0.5111 ppm, exceeding the Threshold Limit Value (TLV).

2. The mean of trans, trans muconic acid (tt-MA) levels in the urine of the subject is at 555.65 µg/ g creatinine, exceeding the Biological Exposure Indices (BEI).

3. There is a relationship between the working hours (hours/ day) with the levels of urinett-MA of the subject.

Conflict of Interest: None

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

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

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

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Effect of Food Containing High Fe (Iron) Intake to Urinary Trans, Trans-muconic Acid (Tt-ma) Levels on Workers Exposed to Benzene

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ABSTRACT

Glue is one of important material in the footwear manufacture which is contained benzene. Benzene vapour can enter body through the respiratory tract easily. Benzene is going to metabolism by CYP 2E1 in the liver to form trans, trans muconic acid (tt-MA) and going to excrete simultaneously with urine. Before formed tt-MA, benzene is oxidized to an epoxy benzene and benzene oxepin which are electrophilic. It can cause cancer by DNA adduct. The increase of the rate of benzene metabolism can increase tt-MA formation and reduce the risk of DNA adducts. Benzene metabolism can be enhanced by increasing Fe intake.

The study aims to analyze the effect of high dietary intake of Fe with the concentration of urinary trans, trans-muconic acid (tt-MA) in the shoe worker. Pre-experimental study with one group pretest posttest design was conducted and 19 subjects of this study recruited who had fulfilled the inclusion criteria.Worker characteristics (age, sex, and residence), nutritional status (body mass index), activity pattern (exposure time, exposure frequency and smoking habit), Fe absorption inhibitor consumption and benzene air level were identified. Urinary tt-MA measurement performed twice, before and after intervention. The intervention was giving meal containing high Fe for 56 hours (3 times/day). Weighing leftovers and recall Fe absorption inhibitor consumption was conducted in the end of every meal time.

The study result showed that Fe intake from meat had effect on alteration of urinary tt-MA level ($p<\alpha$), while Fe intake from staple food, vegetables, eggs and nuts had no effect on alteration of urinary tt-MA level ($p>\alpha$).

Keywords: *tt-MA, Benzene, Fe, Shoe Worker*

INTRODUCTION

Informal footwear industry which is now considered as a growing industry in Indonesia. Glue is one of important material in the footwear manufacture. Benzene is an organic solvent contained in the glue which is volatile. It makes the benzene vapour enter into the body through the respiratory tract easily[1,3].

The benzene content in the glue is around 1.5%, but IARC (International Agency for Research on Cancer) categorizes benzene into group 1, means that this substance is proven to be carcinogenic in humans[2,5]. When benzene enters the body, it will first oxidized into benzene epoxy by Cytochrome P450 2E1 (CYP 2E1) enzyme. CYP 2E1 metabolize the benzene epoxy into benzene oksepin. Both benzene epoxy and benzene oksepin are metabolized into open chain benzene by the CYP to become trans, trans muconaldehid or conjugates with glutathione to form S-phenilmecapturic acid (S-PMA) excreted by urine. Trans, trans muconaldehid oxidized into trans, trans muconic acid (tt-MA) then excreted by urine[3,6,7]. At the benzene exposure of <1 ppm, body tend to produce trans, trans muconic acid as a result of benzene metabolism than phenol and hydroquinone. Whereas, at the benzene exposure of >1 ppm, body will form phenol than trans, trans muconic acid[6,7].

CYP 2E1 is known as the main enzymes that metabolize benzene. It is found in the liver tissue.

Benzene metabolism, at the benzene exposure of >1 ppm, is dominated by CYP 2E1 enzyme[8,9,10]. The existence of CYP enzyme affects the body ability to metabolize the xenobiotic. Both the increased levels and activity of CYP led to the increased rate of xenobiotic metabolism and increases the excretion rate of xenobiotics. Those activities can reduce the toxicity effects of xenobiotics[11]. Therefore, the increased activity of CYP can increase the rate of benzene metabolism in the body which then led to the increased levels of benzene metabolites such as urinary tt-MA. tt-MA can be used as biomarker of benzene to describe the individual exposure to benzene or to show the body ability to metabolize benzene.

The pathways of benzene metabolism becoming tt-MA involves both CYP and Fe activity as catalyst[3,5]. Instead of becoming catalyst, the existence of Fe in the body is also important for the activity of CYP. This is due to Fe as the main components which play an important role in the activity of CYP enzyme[12,16,17]. Fe has ability to modulate the biochemical and toxicological action of CYP 2E1 and therefore, the existence of Fe is enriched the CYP2E1 in microsomal[15]. The low concentration of Fe in the liver can decrease the rate of metabolism of xenobiotics, since, in the xenobiotic metabolism, Fe is necessary for the liver to bind to the heme, which then become a constituent of cytochrome P450[12].

It is possible that benzene enter the body of footwear craftsmen workers. It is metabolized through the high affinity pathway which tends to break the cyclic chain of benzene into the long-open chain, and therefore, it form tt-MA as metabolite in the urine. Fe has a significant role in the metabolic pathway either as an active component of CYP or as a catalyst in the benzene cyclic chain termination.

MATERIAL AND METHOD

This study is a pre-experimental design with one group pretest and posttest. The measurements of tt-MA was done before (pre-test) and after (post-test) the intervention by giving foods containing high concentration of Fe. Providing food containing high Fe was done at every mealtime, 3 times a day (morning, afternoon and evening), 8 times. The value of Fe in intervention based on the RDA (Recommended Daily Intake) plus 30%. The posttest was performed 56 hours (the benzene clearance time) after the first intervention was carried out. The number of subjects was 19 people, not in the state of pregnancy, menstruation and postnatal, not taking medications regularly in more than one year, not consuming alcohol, having normal hemoglobin levels. Age, gender, smoking habits, nutritional status, working hours and coffee and tea consumption daily during the intervention was identified by using questionnaires, interviews and weight and height measurement. The research was conducted in 7 footwear home industry in Tambak Oso Wilangun, held in November 2016.

FINDINGS

The Characteristics of the research subjects can be seen in Table 1.

Table 1. The Characteristics of Subjects

No	Variable	Category	Result	
			n	%
1	Age (years)	20 – 40	6	31,6
		> 40 – 50	5	26,3
		> 50	8	42,1
2	Sex	Male	10	52,6
		Female	9	47,4
3	Nutritional Status (BMI)*	Thin (<18.5)	1	5,3
		Normal (18.5-25)	8	42,1
		Fat (> 25)	10	52,7
4	Working Hours (hours/ day)	≤8	5	26,3
		>8	14	73,7
5	Smoking Habit	Smoker	8	42,1
		Not smoker	11	57,9

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

There are 8 points of the air benzene levels measurement in the 7 work locations. The measurement was conducted to determine the condition of benzene exposure in the workplace as seen in Table 2.

Table 2. The Level of Benzene in the Air

Benzene Concentration	N	%
< 0,5 ppm	6	75%
≥ 0,5 ppm	2	25%
Mean	0,51 ppm	
Standart Deviation	0,79 ppm	
Min - Max	0,01 – 2,33 ppm	

* TLV Benzene: 0,5 ppm[12]

Table 2 shows the there are 2 points of measurements in which the levels of benzene in the air is above TLV (0,5 ppm).

The measurement of tt-MA levels in the urine was done 2 times, at pre-test and post-test. The post-test was performed 56 hours (time of benzene clearance) after the first meals was given. The alteration of tt-MA level based on pre-test and post-test measurements can be seen in Table 3.

Table 3. The Alteration Levels of tt-MA

Alteration of tt-MA Levels (μg/g kreatinin)	Result	
	n	%
(-500) – <0	6	31,6
> 0 – 500	5	26,3
> 500	8	42,1

The mean of pre-test of urinary tt-MA levels is 515,69 μg/g creatinine and post-test 1019,53 μg/g creatinine. The increased levels of urinary tt-MA is 503.84 μg/g creatinine (97.7%). Table 3 shows that the levels of urinary tt-MA mostly increased after the intervention. The highest level of increase of urine tt-MA is >500 μg/g creatinine.

The consumption of coffee and tea daily during the administration of intervention was conducted through food recall interview. Most subjects consume coffee and do not consume tea daily during the intervention (Table 4)

Tabel 4. Coffee and Tea Consumption

No	Variable	Category	Result	
			n	%
1	Coffee	consumption	10	52,6
		Not consumption	9	47,4
2	Tea	consumption	6	31,6
		Not consumption	13	68,4

The Fe intake obtained from the deviation calculation of the Fe concentration in the food given by using the Fe concentration of leftovers. The Fe intake from the interventions was categorized into 5 types of food (Table 5). The Fe intake during the administration of treatment was divided into two categories: less than (<77% *Fe* from the food given) and enough (≥77% Fe from the food given)[18].

Table 5. The Intake of Fe Based on the Type of Food

No	Types of food	Category	Result	
			n	%
1	Staple food (mg)	Enough	15	78,9
		Less	4	21,1
		Mean (1,22)	-	-
2	Meat (mg)	Enough	13	68,4
		Less	6	31,6
		Mean (7,95)	-	-
3	Vegetables (mg)	Enough	18	94,7
		Less	1	5,3
		Mean (0,75)	-	-
4	Eggs (mg)	Enough	17	89,5
		Less	2	10,5
		Mean (0,59)	-	-
5	Nuts (mg)	Enough	19	100
		Less	0	0
		Mean (9,41)	-	-

The statistical test of simple linear regression was conducted for the normally distributed data and the statistical test of logistic regression was performed for the not normally distributed data. The purpose of this test is to determine the effect of *Fe* intake on the alteration levels of urinary tt-MA. The results of the statistics test can be seen in Table 6.

Table 6. The Results of Normality Test and the Effect of Fe Intake on the Alteration Levels of Urinary tt-MA

No	Types of food	p- value	Result
1	Makanan Pokok	0,751	Insignificant
2	Daging	0,001	Significant
3	Sayuran	1,000	Insignificant
4	Telur	0,999	Insignificant
(α = 0,05)			

The Fe intake of nuts was not tested due to the homogeneous data.

The statistical test of logistic regression was performed to determine the effect of coffee and tea consumption daily during the intervention on the changes levels of urine tt-MA (Table 7).

Table 7. The Test Results of the Effect of Coffee and Tea Consumption on the Alteration Levels of tt-MA

No	Consumption	p- value	Result
1	Kopi	0,053	Insignificant
2	Teh	0,698	Insignificant
(α = 0,05)			

The Effect of Fe Intake on the Alteration Levels of Urinary tt-MA

Fe plays a significant role in the metabolism of benzene in the body, as an active constituent of CYP 2E1. CYP 2E1 is an enzyme that metabolizes benzene entering the body into its metabolites. The metabolism of benzene occurs in the liver and bone marrow[3,6].

Benzene exposured can cause the increased levels of Fe in the liver and bone marrow. The increased levels of Fe indicate an increase in the metabolic activity of benzene inside those organs[20]. The Fe existence in the liver and bone marrow play role in metabolizing benzene through binds to apoprotein to form CYP 2E1. Fe supplementation can increase the number of cytochrome P450 in the liver to metabolize drugs[14]. Enough Fe intake help the body to metabolize benzene to form its metabolites such as tt-MA excreted from the body through urine.

This research was conducted by giving food containing high Fe for 56 hours to the workers exposed to benzene and it is expected to help in increasing the metabolism of xenobiotics benzene which showed by the increased levels of urinary tt-MA. There are 5 types of food as sources of Fe in each menu, including: staple food, eggs, vegetables, nuts and meat.

Results based on the regression test of Fe intake of food types on the alteration levels of urinary tt-MA indicates that Fe intake from staple food, eggs, vegetables and nuts has no effect on the alteration level of urinary tt-MA ($p>\alpha$). Whereas, the Fe intake from meat has an effect on the alteration levels of urine tt-MA ($p<\alpha$).

Fe derived from meat is heme Fe. The bioavailability of heme Fe is higher than the non-heme Fe which is mostly found in the vegetative foods. The bioavailability of heme Fe is around 30-35%. Heme Fe can be easily absorbed in the intestinal lumen. This is due to heme Fe is not affected by other nutrients which act as inhibitors of Fe absorption such as polyphenols and tannins from the tea or coffee. Moreover, heme Fe is soluble in the oxidizing environment in the gut. It caused by the porphyrin ring which prevents the heme Fe to form insoluble polymers in the environment of small intestine[13,19]. Unlike heme Fe, non heme Fe is easily oxidized in the gut to form long chain of polymer Fe which is insoluble so that it cannot pass through the intestinal mucous membrane to be absorbed[13]. It supports the regression test result of this research which indicates that consuming coffee and tea daily during the intervention does not affect the levels changes of urine tt-MA.

Heme Fe entering the intestinal mucosal cells (enterocyte) is released from the porphyrin ring by heme oxygenase enzyme. Then, Fe is transported across the basolateral membrane in Fe^{2+} form (ferrous) through ferroportin. Fe^{2+} is oxidized by haephestin to Fe^{3+} which then binds to transferrin and transported to the plasma. Through tranferin, Fe can be distributed to the liver. In the liver cells particularly inside the mitochondria, Fe undergo coupling reaction with protoporphyrin IX to form heme by the enzyme of ferrochelatase. This heme, which then binds to apoprotein in the endoplasmic reticulum of liver cells, to form CYP. It is going to further differentiate into families CYP 2E1[13,16]. Then CYP 2E1 metabolize benzene in the liver to form tt-MA[3].

CONCLUSION

Fe intake from staple food, eggs, vegetables and nuts has no effect on the alteration level of urinary tt-MA. Whereas, the Fe intake from meat has an effect on the alteration levels of urine tt-MA.

Conflict of Interest: None

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

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

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

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Awareness and Perception of Bioethics among Medical Undergraduate Students and Interns in a Private Medical College in Mangalore

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ABSTRACT

Introduction: Ethics or morals are rules or norms for conduct to differentiate between right and wrong. As such medical students have to be provided with scientific knowledge including moral aspects. Before spreading and engraining bioethics in students, we need to determine the prevailing knowledge and attitudes towards bioethics. **Methodology:** A cross sectional study was done among 316 undergraduate students and 54 interns of Kasturba Medical College, Mangalore. Data were collected using a pretested questionnaire and analyzed using SPSS version 16. **Results:** 81% of participants knew the definition of bioethics. 84.1% believed that bioethics will be important to them in the future, though 53.5% said that it was never discussed in their class. **Conclusion:** There is a need for greater discussion and teaching about practices of bioethics to the students in the classroom setting.

Keywords: *Bioethics, Doctor-patient relationship*

INTRODUCTION

Bioethics is a system of moral principles that apply values and judgments to the practice of medicine. [1] In the words of pioneer bioethicist Albert Johnson, bioethicists are those who "blazed trails into a field of study that was unexplored and built conceptual roads through unprecedented problems."[2]

Bioethics encompasses matters of confidentiality, shared medical decision making, respect for patient autonomy, beneficence, non- maleficence and justice in medical practice. It also involves genetically modified organisms (GMO), gene therapy, cloning, abortion, organ transplantation, and many more. [3,4] However, with increasing commercialization of medical practice, ethics has taken a back seat.[5]

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Along with clinical knowledge, medical practitioners must be compassionate and understand that doctor patient relationship forms the backbone of medical practice. Hence a patient has to be treated holistically, encompassing human values. These ethical problems arise day to day in the hospital and outpatient settings, especially for students who have just graduated and are new to the practical environment.[5]

MATERIALS AND METHOD

This cross sectional study was conducted in Kasturba Medical College, Mangalore. The college has a total strength of around 1200 students with 250 students per batch in MBBS course. More than 471 papers were published in the year 2013 and maximum number of undergraduate research projects was selected by ICMR-STS from Kasturba medical college, Mangalore. Considerable amount of money has been invested in research projects with the help of funding from the university. This study was conducted in May 2015. The study population consisted of undergraduate students and interns of Kasturba Medical College, who

had given consent.

Based on a previous study which had a prevalence of 43% of adequate knowledge of bioethics the sample size calculated was 370. A questionnaire was formulated to assess the awareness and knowledge of bioethics among the study population. The questionnaire consisted of 3 sections; section I consisted of demographic details of the participants, section II assessed their awareness of bioethics and section III accessed their perception about the same. The study was conducted after taking prior permission from the Dean of Kasturba Medical College, Mangalore and approval from the Institutional Ethics Committee. Participant information sheets were administered to the undergraduates and interns which explained the entire nature, purpose and importance of the study. Followed by which an informed consent was taken from the willing participants and then the participants were given the questionnaire which was to be filled by them.

The collected data was entered in MS Excel and transferred to a statistical package SPSS (Statistical package for social science) version 16.0 for analysis. Results were expressed in the form of percentages and proportions.

RESULTS

Our surveyed population consisted of 370 participants, 79 students each from first year, second year, third year and final year and 54 interns. Of these, a majority were Hindus (79.7%), 54.1% were females and rest were males.

Of the surveyed population, the age range of participants was 18-39 years, with a mean of about 21 years.

TABLE 1: DEMOGRAPHIC DETAILS OF THE STUDY PARTICIPANTS (N=370)

Character	Number (%)
Gender:	
Males Females	170(45.9) 200(54.1)
Semester:	
Second Fourth Sixth Eighth Interns	79(21.4) 79(21.4) 79(21.4) 79(21.4) 54(14.6)
Religion:	
Hindus Muslims Christians Others	295(79.7) 37(10) 23(6.2) 15(4.1)

TABLE 2: AWARENESS ABOUT BIOETHICS AMONG THE STUDY PARTICIPANTS (N=370)

Character	Number (%)
Participants who were aware that bioethics includes the moral principles that apply values and judgments to the practice of medicine.	299(80.8)
Participants who were aware about the applicability of bioethics to both humans and animals	339(91.6)
Participants who were aware about the existence of ethics committee in the college	219(59.2)
Participants who knew that a different bioethics committee exists for approval regarding animal based research	142(38.4)
Participants who knew that all research require approval from ethics committee	280(75.7)
Participants who considered bioethics to be of importance in the future	311(84.1)

As shown in table-2, 80.8% of the students knew correctly that bioethics includes the moral principles that apply values and judgments to the practice of medicine. 91.6% of the students were aware that the concept of bioethics is applicable to both humans and animals. Only 59.2% of the students are aware of the existence of a bioethics committee in our college. 75.7% of the students know that all research, including non-invasive type, requires clearance from the ethics committee.

When asked about the components of bioethics, 74.1% participants considered doctor-patient

relationship to be the most important component of bioethics followed by 60.8% participants choosing religion of the patient. Only 13.2 % participants thought medical errors to be a component of bioethics.

On being asked about the role of the ethics committee in college 83% of the participants said that the most important role of the committee is to ensure standard ethical practices among healthcare personnel, followed by healthcare personnel when they encounter ethical/legal problems to be the second most important role of the committee which was the thought of 63.2% of participants. Only 22.10% of the participants thought that settling conflicts between professionals and patient's relatives was a role of the ethics committee, while 9.20% participants had no knowledge about this.

TABLE 3: SOURCE OF INFORMATION ABOUT BIOETHICS (n is not equal to sample size as multiple options were correct)

Characteristics	Number (%)
Class room	207(55.9)
Internet	166(44.9)
Media	128(34.6)
Bioethics journals	70(18.9)
Panel discussions	68(18.4)
Court reports	43(11.6)
Place of worship	37(10)
Court	42(11.4)

As shown in table-3, the source of information about bioethics for 55.9% of the students was the classroom. Internet was the source for 44.9% and media for 34.6%. Classroom teaching emerges to be commonest source of information followed by the internet.

When asked if bioethics was discussed in the class, 54% participants said that it was rarely discussed in the class rooms while 19% of them said that it was discussed a lot of times and 20% participants said that it was never discussed in the classrooms.

TABLE 4: COMPONENTS OF CLASSICAL HIPPOCRATIC OATH (n is not equal to sample size as multiple options were correct)

Character	Number (%)
Promise of solidarity with teachers and other physicians	172(46.5)
Promise of beneficence and non-maleficence towards patients	266(71.9)
Promise not to assist in suicide or abortion	121(32.7)
Promise to maintain confidentiality	193(52.2)
Promise not to harm	143(38.6)
Don't know	62(16.2)

Results, as shown in table-4, show that 71.9% believe that promise of beneficence and non-maleficence towards patients, 46.5% students believe that promise of solidarity with teachers and other physicians, 32.7% believe that promise not to assist in suicide or abortion, 52.2% promise to maintain confidentiality, 38.6% promise not to harm are the components of the classical Hippocratic oath.

When asked whom to consult in case of a medico legal issue 49.2% preferred unit head/ any superior, 38.9% preferred lawyer,36.2% preferred hospital administrator, 7.3% preferred colleague, 4.3% preferred internet search, 6.8% preferred insurance company, 4.9% preferred friend/family as their first choice.

TABLE 5: PERCEPTION ABOUT BIOETHICS AMONG THE STUDY PARTICIPANTS (N = 370)

QUESTIONS	Strongly Agree n (%)	Agree n (%)	Neutral n(%)	Disagree n (%)	Strongly Disagree n (%)
Do you think patients wish pertaining to his/ her treatment must always be adhered to?	81(21.9)	**179(48.4)**	75(20.3)	31(8.4)	4(1.1)
Do you think patient's confidentiality is important?	**229(61.9)**	118(31.9)	20(5.4)	1(0.3)	2(0.5)

***Cont...* TABLE 5: PERCEPTION ABOUT BIOETHICS AMONG THE STUDY PARTICIPANTS**

Should the patient's family always be told about the patient's condition?	59(15.9)	**158(42.7)**	111(27.3)	50(13.5)	2(0.5)
In any emergency condition involving a child, should you wait for parent's consent?	57(9.5)	**108(29.2)**	82(22.2)	88(23.8)	35(9.5)
If a terminally ill patient wishes to die, should the doctor assist him/her in doing so?	35(9.5)	109(29.5)	**120(32.4)**	76(20.5)	30(8.1)
If some medical error is made, should the patient always be informed about it?	73 (19.7)	**169 (45.7)**	102 (27.6)	18 (4.9)	8 (2.2)
Should the patient know about his/her diagnosis if the relatives/family wants to protect the information?	50 (13.5)	**133 (35.9)**	131 (35.4)	46 (12.4)	10 (2.7)
Do you think taking consent for starting the treatment even in an emergency situation is important?	28 (7.6)	81 (21.9)	95 (25.7)	**131 (35.4)**	35 (9.5)
Do you think it is ethical to influence a patient's decision to obtain consent?	27 (7.3)	**111 (30)**	98 (26.5)	97(26.2)	37 (10)

As depicted in table-5, when asked about their perception, 48.4% students agreed that the patients wish regarding his/her treatment should always be adhered to while only 8.4% disagreed. 61.9% strongly agreed to the importance of patient confidentiality and just 0.5% strongly disagreed. 42.7% of the participants agreed that a patient's family should always be informed about his/her condition while 27.3% of them were neutral and 13.5% disagreed. When asked if they would wait for parent consent to treat a child in an emergency situation 23.8% agreed while 22.2% were neutral and 23.8% disagreed to the same. When they were asked whether a doctor should assist a terminally ill patient to die if he wishes to, 34.2% participants had a neutral opinion while 29.5% agreed and 20.5% disagreed. 45.7% students agreed that a patient must always be told about any error made in his treatment while 27.6% remained neutral. 13.5% strongly agreed and 35.9% agreed that a patient should always be told about his condition regardless of family and relatives demands. 44.9% students are in favor of starting the treatment without taking consent in case of an emergency. 37.3% students agreed that it is ethical to influence a patient to get consent, around an equal percentage of 36.2 disagreed. (Table 5)

DISCUSSION

With new technologies like cloning and organ transplantation coming up, the process of decision making has become increasingly complex. Making ethical choices is a crucial part of patient care. Hence, medical education is insufficient without a complete understanding of the concept of bioethics. This point is proved by 84% of the participants thinking that bioethics will be important to them in future.

Majority of the participants had correct understanding of definition and the components of bioethics. 92% agree that the concept of bioethics is applicable to animals as well. Being well aware of the basic facts is the first step towards learning more about bioethics.

Of the study participant, 60% are aware of the existence of the Institutional Ethics Committee and most know its specific functions. This can be credited to the workshops conducted by the Institutional Ethics Committee and the Students' Research Forum. But in

a study conducted in West Bengal by Chatterjee et al[8], only 10.9% of the respondents had knowledge of the existence of the institutional ethics committee. Since students in our institution are actively involved in research, the Institutional Ethics Committee could also brief them about the various aspects it looks into before approving any project.

The main source of knowledge about bioethics is said to be the classroom, which is supported by previously conducted studies (Chatterjee,Shiraz[7,8]). This calls for a need to formulate a set curriculum for teaching bioethics in medical school. Measurable outcomes of learning could be specified. Incorporation of bioethics into mainstream medical education would provide a basic framework for the initiation of a learning process. This would ensure a higher level of knowledge about bioethics in undergraduates, which would in turn give us ethically sound medical practitioners in the future.

In case of a medico-legal issue, majority of the participants would prefer to consult their superior or the Unit Head. It could be due to the need to settle the matter at the department level. Most participants would also like to consult a lawyer for their professional expertise. This is concurrent with the results obtained by Hariharan et al[4] in a study performed among doctors and nurses of Barbados in 2006.

With respect to confidentiality, pertaining to the patient's wishes, informing the family and waiting for consent in case of an emergency involving a child, majority of the responses were positive. But no definitive responses were given related to euthanasia, informing the patient about medical errors, taking consent during an emergency situation and influencing the patient into giving consent. In sensitive and highly debatable issues like these, where ethical and legal aspects clash, decision making indeed becomes a daunting task. Case studies and hospital based learning of bioethics could be made available to medical undergraduates to ensure effective decision making.

Since the daily work of medical professionals involves direct intervention into their patients' lives, there is a pressing need to formally train students about the subject of bioethics.

Medical students have to be provided with scientific knowledge including moral aspects. Instead of traditional medical training, ethics must be incorporated in the curriculum. Along with that, seminars, lectures, interactive workshops and academic programs should be made important means for delivering the message of ethics. On an advanced level, even postgraduate diploma courses for ethics should be promoted. Interestingly, even mass media and science fiction movies are popularizing concepts of ethics like organ donation and cloning, respectively. These can also be used as unconventional tools for making students more aware.[3,4]

One of the most important way in which students learn ethical conduct is by watching their seniors and teachers practice. All of the above said and done, before spreading and engraining bioethics in students, we need to determine the prevailing knowledge and attitudes towards bioethics, for which we have done our study.[5]

CONCLUSIONS

Majority of the participants are aware of the principles of bioethics and the functions of bioethics committee. However, most participants are not aware of basic parts of ethics such as Hippocratic Oath and the MTP law. Knowledge possessed by the participants was mainly obtained via classroom discussions, internet and media.

Majority of the participants had a positive attitude regarding patient confidentiality. Most agreed that a patient should be told every detail about his treatment, even if any minor error is made or their family wishes for them not to know. Most participants disagreed to taking consent in any emergency situation. We mostly received a neutral response when asked about euthanasia indicating a difficulty in decision making regarding this for majority of participants.

Conflict of Interest- None

Funding and Support- The study has received no funding and has no prior submission or publication with this study

Ethical Clearance- the study was approved by Institutional ethics committee (Manipal University)

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Detoxification of Benzoic Acid in Workers Exposed to Toluene Using Food Rich in Glycine

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ABSTRACT

One of the toxins found in shoe industry affecting the health of the workers is toluene. Toluene contains *safat*, a high toxicity with liver and kidneys as the main targets. This research aims to determine the effects of consuming food rich in glycine on hippuric acid levels in the urine of shoe industry workers exposed to high levels of toluene. This research is an experimental study using certain treatments for the research subjects consisting of workers exposed to toluene at some shoe home-industries. Before working, the workers were examined for hippuric acid level in their urine. The workers were then given food rich in glycine to eat. After three days of consuming food containing glycine, the workers were examined again for hippuric acid level in their urine. The findings of the study showed that the level of toluene in the shoe home-industry A was 511.8 mg/m^3 which was three times greater than the standard reference of the normal toluene level recommended by Permenakertrans No.13 of 2011 (168 mg/m^3). The results also showed that the mean concentration of hippuric acid in their urine before consuming food rich in glycine was 0.4855 g/L while the mean concentration of hippuric acid in their urine after the intake of food containing glycine was 0.649 g/L. It means that there was an increase of 33.8% in hippuric acid levels secreted in their urine. In conclusion, glycine is effective to detoxify benzoic acid from the body of workers exposed to toluene.

Keywords: *toluene, workers, benzoic acid, glycine, hippuric acid*

INTRODUCTION

Raw materials used in the production process of shoes, such as adhesives and paints, contain organic solevents. The solevents are mainly composed of benzene, xylene, ethyl benzene, toluene, and n-hexane. So that the workers can be exposed to those chemical compounds through inhalation and skin absorption. Oral intake even has also been reported in some cases.

Shoe industries use raw materials, such as toluene. This chemical material when inhaled into the body will undergo Phase I and Phase II biotransformation. Studies on human biotransformation and elimination systems have continually been developed[12]. Various clinical and in vivo studies have also been conducted to evaluate the effects of food and its components on detoxification, including phase I of cytochrome P450 enzyme and phase II of conjugation enzymes. In Phase I biotransformation, toluene will perfectly generate benzoic acid, and it will react with glycine, part of the protein in Phase II biotransformation, to generate hippuric acid excreted through urine. This first phase of the biotransformation of toluene into benzoic acid is highly dependent on the role of cytochrome P450. Next, benzoic acid will react with glycine to generate hippuric acid, and in urine this can be used as an indicator of toluene detoxification.

Based on the results of a research conducted by the USDA[16] is used for data comparison and analisys.

MATERIAL AND METHOD

This research is an experimental study using certain treatments for the research subjects consisting of workers exposed to toluene at some shoe home-industries. Before working, the workers were examined for hippuric acid level in their urine. The workers were then given food rich in glycine to eat. Food containing glycine given to the workers includes tomatoes, beans, spinach, asparagus, garlic, tuna, and milk. Those kinds

of food in the form of vegetables, fish, and milk with the same weight were given to each worker. After three days of consuming food containing glycine, the workers were examined again for hippuric acid level in their urine. Hippuric acid level before and after the meals contained in their urine were then compared to determine the effects of food containing glycine on the level of hippuric acid excreted in their urine.

The number of the research subjects in this research was 20 workers from Tambak Oso Wilangun area. The independent variables in this research were toluene vapor exposure with a unit of mg/m^3, while the dependent variables were hippuric acid levels in urine with a unit of mg/L.

To examine the differences in the levels of toluene and hippuric acid between the treated group and the untreated group, unpaired T test was performed.

FINDINGS

a. General Description of the Research Location

Two types of glue used in the gluing process for shoe home industry: yellow glue (Super SM brand) as well as white glue and LK glue (PU-Weber, DS-Bond DNS 818). Yellow glue is used to join opening parts, and white glue is generally used to patch sole due to its stronger adhesive power. In weekdays, they can spend 30-40 kg of yellow glue and 30 kg of white glue. Glue is poured it into small containers, or by directly using the container of the glue weighed 3 kg.

The workers usually glue using their fingers directly without gloves and masks. The air condition is very hot with terrible glue fume smell. Most workers even work shirtless, smoke, eat and also rest or sleep in the same area.

The condition of the workers is more or less the same as the other shoe craftsmen in general. The working environment is poorly ordered, all section were all located in the same room together with the storage place of other raw materials. In addition, the ventilation system is inadequate and lack of exhaust fans or even without any fans.

b. Concentrations of Toluene in the Workplaces

Table 1 shows the concentrations of toluene in the shoe home-industries. The toluene concentration measurement in a unit of ppm and in temperature of celsius degrees was performed by UPT K3 Hiperkes in East Java Province. The measurement results are shown in the table below.

Table 1. Concentrations of Toluene in the Workplaces

Location	Time (Wib)	Toluena concentrations (ppm)	Dry Temperature	Temperature in o Kelvin	^oK x R	#Ppm x BM	Toluena levels (mg/m^3	Note:
A	12.22	138.882	31.7	304.7	24.99	12789.5	511.8	>
B	12.35	4.246	32.8	305.8	25.075	391.9	15.6	<
C	12.50	10.763	31.9	304.9	25.042	991.6	39.6	<
D	12.59	4.413	32.4	305.4	25.042	406.6	16.23	<
E	13.07	11.264	32.6	305.6	25.059	1037.8	41.41	<
F	13.30	0.968	30.9	309.9	25.387	89.2	3.51	<
G	13.33	0.675	30.9	303.9	24.920	62.3	2.50	<
H	13.40	0.212	31.6	304.6	24.980	19.5	0.78	<
I	13.50	0.878	31.7	304.7	24.990	80.9	3.23	<

Note: NAB toluene 168 mg/m^3. (<: Less than NAB,>: greater than NAB)

Based on Permenakertrans No.13 of 2011, the standard reference of the normal toluene concentration in working environment is 168 mg/m^3. As shown in Table 1 above, the highest level of toluene in location A was 511.8 mg/m^3, while the smallest concentration of 0.78 mg/m^3 in Location H, and the average concentration was 70.52 mg/m^3.

c. Glycine Weights in Food

Types of food and meal time as indicated in the table below.

Table 2. Glycine Weights at Each Meal Time

No	Days (Meal Time)	Types of Food (g)						Glycine Weight (g)
1	Saturday (Breakfast)	Spinach 80 gr	Glycine weight 80/100 x 0.645= 0.516	**Pepes** tuna 100 gr	Glycine weight 1.436	-		1.952
2	Saturday (Lunch)	Stir-fried green beans 70 gr	70/172 X0,6 0.244	Leeks 33 gr	33/112 X3,47 1.022	Fried tempeh 20 gr	20/100 X1,38 0.276	2.509
3	Saturday (Dinner)	Leeks 33 g	1.022	Stir-fried yard long beans 70 gr	70/100 x1,73 1.211	Fried tempeh 20 gr	0.276	2.509
4	Sunday (Breakfast)	Yard long beans 70 gr	1.211	Leeks 25 gr	1.022	Fried tempeh 20 gr	0.276	2.509
5	Sunday (Lunch)	Tuna 100 gr	1.436	Stir-fried yard long beans 70 gr	1.211	Fried tempeh 20 gr	0.276	2.923
6	Sunday (Dinner)	Seaweed 70 gr	70/100 X 3.009= 2.11	Paprika (33 g)+ tempeh (20 g)	33/100 X0,66=0.22 + 0.276 = 0.496	Tuna 100 gr	1.436	4.43
7	Monday (Breakfast)	Yard long beans with peanut sauce 70 gr	1.211	Fried tempeh 20 gr	0.276	-		1.487
8	Monday (Lunch)	Tuna 100 gr 1.436		Green Beans 70 gr	0.244	Fried tempeh 20 gr	0.276	1.956

Based on the table above, the greatest weight of glycine consumed by the workers was on day six which was 4.43 grams. Meanwhile, the smallest was on day 7 which was 1.487 g, and the mean weight of glycine per one meal was 2,534 g.

d. The Measurement Results of Hippuric Acid Levels

The results of the measurement of hippuric acid levels before and after the administration of food containing glycine were as follow:

Table 3. Hippuric Acid Levels before and after the Administration of Food Containing Glycine

No. Sample	Hippuric Acid Levels in the urine (g/L) on June 12, 2015	Hippuric Acid Levels in the urine (g/L) on June 15, 2015
1	0.56	1.12
2	0.51	-
3	0.58	0.35
4	0.79	0.35
5	0.35	0.19
6	0.61	0.59
7	0.53	1.14
8	0.41	0.98
9	0.48	0.52
10	0.40	0.98
11	0.68	0.31
12	0.19	0.70
13	0.49	-
14	0.08	0.65
15	0.27	0.44
16	0.05	1.63
17	0.78	1.06
18	0.11	0.75
19	0.37	0.75
20	1.47	0.68
Total	9.71	11.69
Mean	0.4855	0.649

Table 3 above shows that the mean level of hippuric acid prior to the administration of food rich in glycine was 0.4855 mh/L, while the mean level of hippuric acid after the administration was 0.649 mg/L. It indicates that there was an increase in the excretion of hippuric acid after the administration of food rich in glycine. This means, it can accelerate the increase in the excretion of hippuric acid, about (0.164 g/l/0.4855) x 100% = 33.8%.

e. The Correlation between Toluene Concentrations in the Air and Benzoic Acid Concentrations in the Blood

To decrease the concentrations of toluene in home-industries, it is necessary to repair the ventilation by using natural ventilation or artificial ventilation. Natural ventilation is made by using a window with an area of at least 1/5 - 1/6 of floor space. Artificial ventilation is made by using a scrubber designed specifically for toluene vapor.

The regression equation used for the correlation between the concentrations of toluene in the air and the concentrations of benzoic acid in the blood is as follows:

Y = 0.599x mg / L / h + 15.23, with r = 0.12[3]

By using the regression equation above, it can be estimated the concentration of benzoic acid in the blood of the workers at the toluene concentration of 511.8 mg/$m^3$was as follows:

Y = 0.59 9 (511.8) + 15.23 = 321.8 mg/L/h = 2574.4 mg/L (for 8 hours)

With the same equation for toluene concentration 0.78 mg/m^3, Y = 15.697 mg/L = 376.728 mg/L (for 8 hours), and for concentration 70.52 mg/m^3, Y = 57.47 mg/L = 459.76 mg/L (for 8 hours)

f. Concentrations of Hippuric Acid in the Urine

As shown on Table 2 above, the largest consumed glycine was 4.43 grams on day 6 while the smallest one was 1.487 g on day 7. The mean weight of glycine per one meal was 2.534 g.

The mean blood volume in a person weighed 70 kg is 5 liters. If all glycine was absorbed with an average of 2.534 grams per one meal or 7.602 grams/day, the mean level of glycine in the blood would be 7.602 g/5 liters of blood or 1.5204 g/L.

The concentration of hippuric acid in the urine before intaking was 0.4855 g/L and it became 0.649 g/L after intaking. Therefore, there was an increase in the urinary excretion of 33.8%.

Based on the guidelines[1], biological exposure index of hippuric acid in urine is 2.5 g/g creatinine; whereas, toluene level in blood is 1.0 mg/L. Meanwhile, the concentration of hippuric acid in adults is 0.44 ± 0.20 g/L which is equivalent to 0.7 g/g creatinine[14]. Unlike the previous researcher, that the exposure to 100 ppm of toluene at the end of the work shift can trigger the concentration of hippuric acid into 0.4 g/L which is equivalent to 5 g/g creatinine[11]. On the other hand, the maximal concentration of hippuric acid is 2.5 g/g creatinine with a normal range of 1.5 g/g creatinine[10].

Based on those references, the concentration of hippuric acid in urine is 0.649 g/L which is equivalent to 8.1125 g/g creatinine obtained from (0.649 g/L: 0.4 g/L) x 5 g/g. The normal concentration of hippuric acid is 2.5 g/g creatinine[1]; whereas, it is 1.5 g/g creatinine[10]. The concentration of hippuric acid in the urine of the workers in this research is considered to be abnormal.

If the standard reference by ACGIH is used, it should be lowered again to 2.5 g/g creatinine or (8.1125 to 2.5) or 5.6125 g/g creatinine or 69.1%.

The molecular weight of hippuric acid is 179.17 g/mol while the molecular weight of glycine is 75.0699 g/mol. In addition, the molecular weight of benzoic acid is 122 g/mol. The mean molecular weight of hippuric acid excreted is 0.0036 mol/L derived from 0.649 g/L : 179.17 g/mol. The mean molecular weight of benzoic acid is 459.76 mg/L or 0.45976 g/L which is equal to 0.0038 mol derived from 0.45976 g/L: 122 g/mol.

It can be said that for benzoic acid at a mean concentration of 0.0038 mol /L, the concentration of glycine that must be taken is 0.0038 mol /L in 8 hours in order to excrete entire benzoic acid into hippuric acid. As a result, for glycine with a molecular weight of 75.0699 g/mol, the weight of glycine needed is 0.285 g within 8 working hours, obtained from 0.0038 mol /L x 75.0699 g/mol. Meanwhile, the mean weight of glycine given to the research subjects in each meal was 2,534 g at breakfast, lunch, and dinner. If the normal weight of glycine in one meal is 2.534 grams within 8 working hours, that there is an excess of about 2.249, obtained from 2.534 g - 0.285 grams, in the food given to the research subjects to lower the levels of toluene and benzoic acid from their body.

For those reasons, for those workers in the work environment containing the highest toluene concentration of 511.8 mg/m^3 with the benzoic acid concentration of 2574.4 mg/L or 2.5744 g/L, equivalent to 0.021 mol/L, as much as 0.021 mol/L glycine which is equal to 15.765 gram glycine derived from 0.21 mol/L x 75.0699 g/mol is required to lower the benzoic acid concentration. The portion of food containing glycine needs to be increased to 15.765 g / 2.534 g or 6.22 times greater than the mean portion of glycine given during the research.

CONCLUSION

Based on the results of this research, it can be concluded that:

a. The mean concentration of toluene in this research was 70.52 mg/m^3 which was still below the standard reference of the normal toluene concentration recommended by Permenakertrans No.13 of 2011 (168 mg/m^3). The level of toluene in the shoe home-industry A was 511.8 mg/ m^3. This high concentration of toluene in the shoe home-industries was due to poor ventilation.

b. The mean concentration of hippuric acid in the urine before intaking food rich in glycine was 0.4855 g/L while the mean concentration of hippuric acid in the urine after intaking food containing glycine was 0.649 g/L. It means that there was an increase in the urinary excretion of about 33.8%.

Conflicts of Interest: All authors have no conflicts of interest to declare.

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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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Bone Marrow Aspiration in Pancytopenia in and around Muzaffarnagar

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ABSTRACT

Background: Pancytopenia is one of the most common indications for bone marrow examination (BME). There are spectrum of conditions involving the bone marrow that can present with pancytopenia and include malignant as well as benign diseases.

Aims and objectives: The objective of this study was to evaluate the BM findings in cases of pancytopenia.

Materials and Method: This was a prospective study of 70 cases of pancytopenia presenting over a period of 1 year.

Results: Out of 70 cases, the most common cause for pancytopenia in this study was megaloblastic anemia (58.53%). Acute leukemia (12.85%), aplastic anemia (8.58%), myelofibrosis (8.58%), myelodysplastic syndrome (MDS) (5.73%), multiple myeloma (5.73%) were the other causes of pancytopenia.

Conclusion: BME is an important investigation in diagnostic workup of cases of pancytopenia. In majority of cases, it can provide an accurate diagnosis or atleast can guide the approach towards diagnosis and management. Thus, it should be performed in all cases of persistent pancytopenia.

Keywords: *Pancytopenia, Bone marrow aspiration, Bone marrow examination.*

INTRODUCTION

Pancytopenia is defined by the reduction in all three formed elements of blood (haemoglobin<10gm/dl, total leukocyte count < 4000/mm^3 and platelet count <150,000/mm^3) below the normal references range[1]. The incidence of various haematological disorders causing pancytopenia varies due to geographical distribution and genetic predisposition[2].

Pancytopenia is not a disease entity but a triad of findings that may result from a number of diseased processes[3]. It can be due to hypocellullar bone marrow in various conditions such as acquired aplastic anemia, some myleodysplastic syndrome, Fanconi anemia and aleukemic leukemia or can have normocellular or even hypercellular marrow with or without any abnormal cells e.g. ineffective haematopoiesis and dysplasia & peripheral sequestration of cellular components. The management and prognosis of pancytopenia depends on underlying pathology[4].

In cases of pancytopenia, patient usually presents with clinical features attributable to decreased number of RBC's, platelets or WBC's i.e; pallor, easy fatigability, bleeding, weight loss or repeated infections leading to fever[5].

Pancytopenia may be associated with various morphological changes in the bone marrow. Correlation

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with bone marrow biopsy is also important in cases where aspirate is hemodiluted or hypocellular. Bone marrow biopsy also helps in many conditions which focally involve the bone marrow like metastatic carcinoma, lymphoma or granuloma.

This study was performed in Muzaffarnagar Medical College, Muzaffarnagar and is intended to look at BM findings in cases of Pancytopenia[6].

MATERIALS AND METHOD

Prospective study was conducted in the Department of Pathology in Muzaffarnagar Medical College, Muzaffarnagar on 70 patients encountered during July 2015 to June 2016 after the permission of institutional ethical committee.

Inclusion criteria- Patients of age ≥ 15 years who presented with pancytopenia. Clinical details were obtained from patients and their case files, and were tabulated, analyzed and correlated with that of laboratory parameters.

Exclusion criteria- Patients of age <15 years.

Bone marrow aspiration was performed from posterior superior iliac spine. Smears were prepared and stained with Romanowsky stains like Leishman stain and Giemsa stain. Bone marrow biopsy was processed as per laboratory protocol for bone marrow. Special stains like perl's stain, reticulin stain were performed wherever required.

FINDINGS

Out of total 70 bone marrow aspiration, male: female ratio was 1.18:1 with 38 males and 32 females. The age of the patients ranged from 15 years to 80 years. (Table 1)

Table 1: Bone marrow aspiration findings in pancytopenia (n= 70)

Disease	Age range	Male Patients		Female Patients		Total cases	
		No.	%	No.	%	No.	%
Megaloblastic anemia	15-70 years	19	50	22	68.75	41	58.53
Aleukemic & subleukemic leukemia	16-72 years	4	10.53	5	15.63	9	12.85
Aplastic anemia	15-42 years	4	10.53	2	6.26	6	8.58
Myelofibrosis	19-65 years	5	13.16	1	3.12	6	8.58
Multiple myeloma	58-80 years	3	7.89	1	3.12	4	5.73
Myelodysplastic syndrome	18-65 years	3	7.89	1	3.12	4	5.73
Total	**Age range**	38	100	32	100	70	100

Most common clinical presentation was pallor (100%) followed by fever (77%), weakness (54%), loss of weight (44%), splenomegaly & petechiae/ecchymosis (35.7%),hepatomegaly (28.57%) and associated lymphadenopathy (18.57%).(Fig. 2)

Peripheral smear findings in most of the cases show presence of anisocytosis and poikilocytosis each (>60%) followed by hypersegmented neutrophils (51.42%), nucleated red blood cells (35.71%), and immature WBC (17.14%). (Fig. 3)

BMA findings were hypercellular marrow with erythroid hyperplasia & megaloblastic erythropoiesis in megaloblastic anemia (Fig.1A), hypocellular marrow with increased fat spaces along with the entangled lymphocytes & plasma cells in the marrow fragment in aplastic anemia (Fig.1B), hypercellular marrow with increased plasma cell count in multiple myeloma (Fig.1C), hypercellular marrow with dysplastic erythroid, myeloid and megakaryocytes in myelodysplastic syndrome (Fig1D).

Bone marrow biopsy findings in myelofibrosis showing fibrosis along with micromegacryocytes (Fig1E). Reticulin stain of BMB from a patient of myelofibrosis; showing coarse reticulin fibres- Grade 3 (Fig.1F).

Fig 1: Photomicrograph of BM in pancytopenia Fig.1A–Megaloblastic Anemia (BMA), B–Aplastic Anemia (BMA),C-Multiple Myeloma (BMA), D–Myelodysplastic Syndrome (BMA), E- Myelofibrosis (BMB) & F – Reticulin Stain of myelofibrosis (BMB).

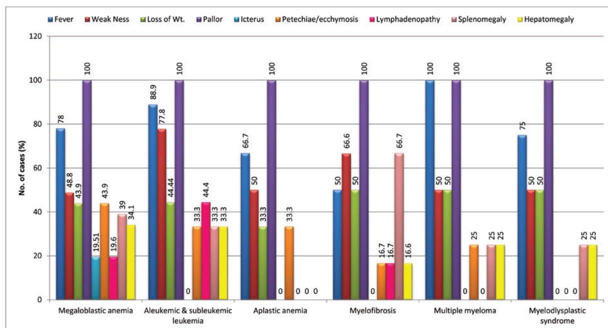

Figure 2 : Clinical findings in Pancytopenic Patients

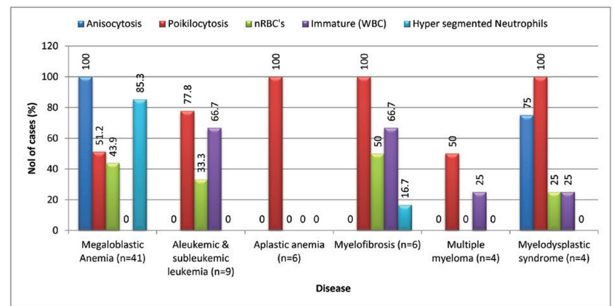

Figure 3: Peripheral blood findings in cases of pancytopenia

DISCUSSION

Pancytopenia is a common hematological finding seen in many diseases and diagnosis still remains a challenge for pathologist as well as to clinician. Accurate diagnosis is very crucial for management of patient. Bone marrow examination is very important in investigation of patients with pancytopenia and should be looked carefully to achieve proper diagnosis.

Male: Female ratio in our study was 1.18:1 which is comparable to some studies[7-8] while one study showed

slightly female preponderance[9].

In this study most common cause of pancytopenia was megaloblastic anemia (58.53%) which is comparable to many studies performed[8, 10-13] while few studies found hypoplastic marrow as the most common cause of pancytopenia[7, 14-15].

In our study second most common cause was aleukemic & subleukemic leukemia (12.85%) which is comparable to one study performed[16]. Blasts were seen in peripheral blood smears in (66.6%) cases while rest (33.34%) showed absence of blasts on PBS (aleukemic leukemia). Bone marrow aspiration in all these cases showed features of acute leukemia with > 30% blasts.

Aplastic anemia and myelofibrosis were found in equal percentage (8.58%) each of pancytopenia cases in BMA while few studies showed increased incidence of pancytopenia in aplastic anemia[17,18] and decreased incidence of pancytopenia in myelofibrosis[19,20]. All cases showed reduced count of all three lineages with predominance of lymphocytes on both peripheral blood smears and BMA. All these cases were confirmed on bone marrow biopsy.

In this study, myelodysplastic syndrome and multiple myeloma were found in equal percentage (5.73%) each of cases with pancytopenia in BMA. While few studies found decreased causes of pancytopenia in myelodysplastic syndrome and multiple myeloma [21,22].

LIMITATION OF THE STUDY

In our study, sample size is small (only 70 patients) and being a hospital based observational study; it may not represent underlying general population.

CONCLUSION

Bone marrow examination is an important investigation to be performed in cases of pancytopenia. Diagnosis can be made in majority of cases and it can help the clinician for proper management of the patients having pancytopenia. Most common cause of pancytopenia was megaloblastic anemia suggesting nutritional deficiency that can be treated pharmacologically. When there was a dry tap in BMA, aplastic anemia and myelofibrosis were the causes of pancytopenia. In addition, specific causes of pancytopenia as aleukemic and subleukemic leukemia, multiple myeloma, myelodysplastic syndrome should be kept in mind as some of them can be life threatening. Correlation of clinical, peripheral smear finding and bone marrow aspirate findings are required to arrive at final diagnosis.

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Implication of Malnutrition on Human Capital : Bridging the Inequality through Robust Economic Policies

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ABSTRACT

Concept of human capital is akin to physical capital. Human capital investments like nutrition, health, and education yield dividend resulting in higher income. This occurs through increased productivity or by altered pattern of activities. Correlation between better nutrition, higher productivity and earnings is well known. Malnutrition affects human capital, results in loss of labor productivity and delays national development. Economic cost of malnutrition is estimated at 2-3% of GDP. Reducing malnutrition is essential to accelerate economic growth. Copenhagen Consensus, emphasizes good nutrition as most cost effective means of improving human well being. Various countries have formulated multiple policies to stall malnutrition. The paper discusses impact of malnutrition on human capital and economic development; and, how robust policies can bridge this inequality.

***Keywords**: GDP, Developing countries, Economic impact, Food safety, Human capital, Malnutrition, Malnutrition Policies*

INTRODUCTION

Malnutrition is a scourge in the developing world. It is estimated that 12 million children are born with low-birth-weight every year. More than 180 million pre-school children are malnourished.[1] While it has long been rightly justified to answer this 'health' issue, in its own right; yet, impact of poor nutrition on productivity and economic growth cannot be ignored. Ex-Prime Minister of India and economist, Dr Manmohan Singh, had labelled Malnutrition as a "national shame", owing to its serious implications on human welfare and GDP. Many national governments, international organisations and donors have committed to eliminate malnutrition through more funds and developmental programmes. Even in difficult fiscal climate (2008 to 2011), official development assistance to basic nutrition category has increased from US$259 million to US$418 million. G8 countries reported 50 percent increase in bilateral spending on nutrition-specific interventions. According to Google Trends, "malnutrition", matches "HIV/ AIDS" in terms of internet interest ! The provision of micronutrients is identified as the second best opportunity for meeting world's development challenges along with trade reform and private sector deregulation. The 2008 Copenhagen Consensus concluded that nutrition interventions were among the most cost effective for development.[2]

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Relation of Nutrition and Economics

Since there are gross inequalities in nutritional status of people and consequent economic development, investing in nutrition is vital. There are strong economic arguments for investing in nutrition:

(a) Reduction in malnutrition, increases productivity and economic growth

(b) Malnutrition leads to a higher budget outlay for health and lost GDP.

(c) Benefits from investment in nutrition outweighs its cost.[3]

Malnutrition Control increases productivity and

economic growth [3]

Good human capital depends on good nutrition, contributing to economic development of a nation. Sustainable and equitable growth in developing countries help them become "developed" ones. Improved economic development contributes to improved nutrition but more importantly, improved nutrition drives stronger economic growth.

Malnutrition hampers physical capacity to perform work and individual earning ability and consequently the national economic goals. Malnutrition leads to productivity losses which may be due to:

Malnutrition leads to direct losses in physical productivity: Malnutrition leads to death or disease that reduces productivity. According to WHO, underweight is the single largest risk factor contributing to global burden of disease in developing world. It leads to 15 percent of total DALY (disability-adjusted life year) losses. Low birth weight infants reflecting malnutrition in the womb are at 2 to 10 times higher risk of death compared to normal infants. They are also at higher risk of non communicable diseases (diabetes and cardiovascular disease) in adulthood.

Micronutrients: Micronutrient deficiencies (Vitamins/ minerals) compromise immune system of children. Vitamin A deficiency is responsible for death of one million children and anemia for 60,000 women every year, due to complications in pregnancy and child birth. Anemia effects productivity, especially in physically demanding occupations. Eliminating anemia results in a 5 to 17 percent increase in adult productivity (2 percent of GDP) in poor countries. Iodine deficiency in pregnancy causes 18 million babies a year to be born mentally impaired; with IQ, 10 to 15 points lower. Folic Acid deficiency leads to 250000 severe birth defects every year, world over. Malnourished adults also have higher absenteeism because of illness.

Calorie Intake, Physical Growth and Productivity: The efficiency wage hypothesis substantiates that there is a relationship between calorie intake and work output. Height is a function of nutrition and is related to productivity. A 1% loss in adult height due to childhood stunting reduces 1.4% productivity. Severe micronutrient deficiencies in-utero/early childhood can cause blindness, dwarfism, mental retardation and neural tube defects. In Brazil and USA, height-weight/BMI of adults affect wages, even after controlling for education. In Brazil, a 1 percent increase in height was associated with 4 percent increase in wages. Productivity decreases as BMI drops below 18.5, showing that adults with extremely low weights (for height) have lower productivity. [1]

Losses in Productivity due to Deficits In Cognitive Development: Poor cognitive development due to malnutrition and anemia leads to indirect losses in productivity. Low birth-weight and stunting may reduce IQ by 5 to 11 percent and iodine deficiency by 10 to 15. A child's ability to learn suffers due to growth failure /malnutrition. Zimbabwe reports malnutrition to reduce earnings by 12 percent.

Higher Budget Outlay and Lost GDP: The Cost of Malnutrition

Malnutrition costs low-income countries billions of dollars. A study proved, preventing one child from being born with low birth-weight is worth $580. I is estimated that obesity and related diseases cost China 2 percent of GDP and in India productivity losses from stunting, iodine and iron deficiency together account for loss of 2.95 percent GDP.

Preventing micronutrient deficiencies alone in China will be worth $2.5 to $5 billion annually in increased GDP, (0.2 to 0.4 percent of annual GDP). Micronutrient deficiencies alone may cost India $2.5 billion annually, (0.4 percent annual GDP). One estimate suggests that productivity losses in India associated with undernutrition, anemia, and iodine deficiency disorders, amounted to about $114 billion between 2003 and 2012 (India's annual GDP is about $601 billion). Only the productivity losses associated with forgone wage employment resulting from child malnutrition, are estimated at $2.3 billion in India (0.4 percent of annual GDP).

Malnourished children would require extra health services, more expensive than normal children. At school malnourished children may have to repeat years, thus increasing education costs. In developing countries, governments have to bear these costs.

Benefits from Investment in Nutrition Outweighs its Cost

Taking into account the reduced mortality, reduced medical costs, inter-generational benefits (reduced

likelihood of giving birth to low-birth weight infant in next generation), and increased productivity, it is estimated that, returns from investing in nutrition are high. Costs are rarely evaluated rigorously for nutrition programs. But wherever data is collected, nutrition programs are found to be effective and efficient.

MATERIAL & METHOD

The research methodology involved in-depth study of relevant literature. The available data was assessed and analyzed in context of present topic. Causes and implications of malnutrition on Human Development were analyzed. An independent analysis of various economic policies from different countries, with bearing on malnutrition and thus on human development, productivity and economy was undertaken. Various best practices and success stories were also studied, which could pave way not only for effective control of malnutrition, but also for better human development, productivity and economy.

FINDINGS & DISCUSSION

Economic Growth and Human Capital

Nutrition has definitely improved in the developing world. Stunting fell from 49 to 27 percent for children under age five between 1980 and 2005, and underweight rates declined from 38 to 23 percent. Economic growth has played an important part in this improvement. But economic growth reduces malnutrition very slowly. The countries cannot depend on economic growth alone to reduce malnutrition within an acceptable timeframe, especially given the human and economic costs. The income–malnutrition relationship is modest. When GNP per capita in developing countries doubles, nutrition improves, but reduction in malnutrition rates are modest, from 32 to 23 percent.

In India, at realistic levels of sustained per capita GDP, an economic growth alone would take until 2035 to achieve the nutrition MDG.

Limitations of Market Forces & justifying public investment to bridge inequality

Malnutrition persists, despite the private returns of improved nutrition being considerable. Partially, this is due to resource constraints that limits poor families from investing more resources in children. Unaware and poor people fail to recognize or address malnutrition. They cannot tell when their children are becoming malnourished. Poor nutrition cannot be detected with naked eye until micronutrient deficiencies are severe. Thus parents do not know if there is a nutrition problem until it is late. Moreover families do not really know what food or what feeding practices are best. [3]

Owing to such information gaps, even when families gain additional cash resources, eg. through cash cropping or conditional cash transfers, nutrition does not automatically improve. Given the productive and redistributive benefits of investing in nutrition, there is thus an argument for public intervention to ensure that families get the information they need and to institute policies/programs (such as mandatory salt iodization) that bridge information gaps.

Another reason to justify public investment is that, improved nutrition is often a public good (and not a private good), yielding benefits for everybody in society. Better nutrition can reduce spread of contagious diseases and increase national economic productivity. Moreover the infrastructure and institutions for delivering nutrition services and the authority to implement public interventions lie with the public sector. Thus the government/public sector is in a strong position to bridge this gap of inequality of 'adequate' nutrition for some and 'malnutrition' for most.

Government Policy Measures to Combat Malnutrition

Having discussed the various facets of economy-malnutrition-economy interactions and their implications on human capital, it is easy to note that many remedies to improve the situation, too lie within this framework (besides some direct health/nutrition interventions). To combat the menace of malnutrition, Government of India has introduced many schemes. Some of these endeavour to provide direct intervention to address malnutrition, and others aim at improving socio-economic and living conditions of various sections of the community which would have indirect long term effects on improving the nutritional status and economy of the society.

Some of these include the Integrated Child Development Scheme (ICDS), Mid Day Meal Scheme, Public Distribution System (PDS), Nutrition Programme for Adolescent Girls, *Balika Samriddhi Yojana, Kishori Shakti Yojana*, etc. There are many relevant poverty alleviation programs as well (NREGA, etc), since

poverty is associated with poor diets, unhealthy environments, physically demanding labor, and high fertility, which increase malnutrition. Malnutrition in turn reduces health, education, and immediate / future income, thus perpetuating poverty. Even worse, poor malnourished women are likely to give birth to low-birth weight babies, thus perpetuating poverty in the subsequent generation. Addressing malnutrition helps break this vicious cycle and stop the inter-generational transmission of poverty and malnutrition. All these programs aim to supplement the income of the poor directly or indirectly.

While the ICDS, launched in 1975, delivers an integrated package of services consisting of health care and non health services viz. nutritional, environmental and social services, to the identified beneficiaries in continuum throughout their specified life cycle period through "*Angan Wadi Centre"*; the Mid Day Meal program provides lunch to government school students. The PDS scheme offers grains to poor Below Poverty Line (BPL) community at lower prices, and various other Nutrition programs focus on specific groups like the girls/ children. Programs like NREGA offer employment opportunities.

Success Stories, and Learning from Them

Let us see at some success stories the world over[4]. Beginning with India, in Maharashtra in the year 2006, 39 percent children (under 2 years of age) were stunted. In 2007, State Nutrition Mission was implemented in 15 worst affected districts. Within a year the Mission was extended to remaining 20 districts of the state.[5] The focus was to improve coverage and quality through ICDS and NRHM. In 2010, technical support of UNICEF was sought. Delivery of evidence based intervention for children (under twos) and mothers was scaled up. A combination of facility, outreach and community approaches was struck, keeping gender equity in mind. By 2012, stunting decreased from 39 to 23 percent and severe stunting from 15 to 8 percent. Thus significant reduction in malnutrition was achieved without major budgetary increase, but merely by focusing on improving service delivery systems in ICDS and health sector. High political will played a part, as the Chief Minister chaired many sessions along with bureaucratic leadership and good technical support from UNICEF.[6]

The Latin American country, Peru, too, reeled under malnutrition. A strong political commitment for implementation of coherent nutrition policies focused on under-5s played an important part. The 'Child nutrition initiative' was a 2006 electoral issue. It formed necessary political momentum through persuading all Presidential candidates to sign a pledge to reduce stunting. Civil society organizations, donors and research bodies brought together a range of actors willing to support government in drafting policies to achieve new targets. A new national strategy to condense 82 existing programs in 26, focused on poverty and child nutrition. Considerable improvement in nutrition outcomes appears to be weakly associated with fast economic growth or increasing government expenditure. Result based budgeting allowed advocating for effective and transparent investment on nutrition. An important facet was the JUNTOS cash transfer program, aligned with conditionalities on access to nutrition assistance to the under threes, that simultaneously, with direct nutrition interventions helped tide over the problem faster and more effectively. Further, decentralization of policies to regional and municipal governments also helped. [7,8]

Brazil has successfully integrated Nutrition with Poverty reduction programs. Since early 1990s, food security (Right to food) has been part of Brazil's policy agenda. This has been clubbed with strong political leadership. In 2003, it became a national priority under President Lula da Silva. 'Zero Hunger' (Fome Zero) strategy coordinated programs from 11 ministries and provided a framework for several initiatives, including Bolsa Familia, the flagship conditional cash transfer program.[9] Cash was transferred to families with malnourished children, on the condition that they would attend school regularly. A National School Feeding Program, as part of "Zero Hunger Strategy" was already in place. So 'cash transfer' incentive sent the children to school, who got fed there, this helped bolster literacy as well. There was a marked reduction in child stunting, attributable to decline in poverty, increase in mothers' education, expansion of healthcare coverage and improvement in sanitation as well.

CONCLUSION

Malnutrition has a direct bearing on human capital. It adversely affects productivity, perpetuates poverty and puts a significant burden on government exchequer. [10] The reason malnutrition persist at high levels is not

that we do not know how to reduce it, but it is that most countries have not invested at a scale large, enough to get these tested technologies to those who will benefit from them most. Countries world across might have spent to reduce malnutrition and their efforts are well exhibited in terms of higher productivity thereby improving their GDP. In addition, many countries either used less effective and less strategic interventions (such as school feeding), or have not paid attention to implementation quality. However, neither higher GDP nor market forces alone can help eradicate malnutrition. Deliberate and sincere efforts are required to help curb this problem. A strong political commitment together with community participation can bring desirable results, to bridge the gross inequality that is perpetuating malnutrition.

The 'Best practice" indicate that malnutrition control cannot be done in isolation, in a stand-alone 'nutrition-revival' mode; neither could it be a lone 'economy revival' model. The process has to be an integrated Politico-Economic-Nutrition model, wherein there has to be a strong political will, followed by economic plans in place along with concurrent nutritional interventions that are technically sound and make appropriate 'local' sense to the respective community, given the vast nutrico-cultural diversity. Only these integrated approaches can bring sense to an improved human capital.

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The Effect of Workload on the Job Stress of Nurses in Outpatient Care Unit of Public Hospital Surabaya, Indonesia

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ABSTRACT

Nurses is one of profession who have high risk to suffered of job stress. Public hospital Surabaya is hospital which is teaching hospital type and as a reference hospital healths program from government of National Health Insurance in Surabaya city. The effect of this conditions are increase number of patients and nurse's workload. This case also increasing the opportunity of risk nurse to job stress.

This study aims to assess the prevalence of job stress among nurse in outpatient unit and to investigate the correlation between job stress with individual factors and workload. This study is quantitative research with cross- sectional design, study was conducted during January 2017 and the respondents were recruited by using a total population were 26 nurses. Technique of data collection was based on questionnaire and callorimeter to measure a physical workload. To know the level of influence of each risk factor on the job stress at nurse in outpatient unit then conducted with frequency distribution, and crosstab, then analyzed with the test of logistic regression.

The results of the analysis showed no influence significant between the age, gender, physical workload with job stress. The result of logistic regression showed that there is significant relation of mental workload. Based on result showed mental workload is the dominant factor that influence the job stress. The odds of which is 39,539 times higher at nurses who have major mental workload. Based on these results need efforts to increase cooperation among a nurse with others unit which is related units to work system becomes an effective and efficient, to improve the social support among the co-worker, and to improve the commitment of all staff in the hospital to be more punctual on performing their duty.

Keywords: *nurse, workload, job stress*

INTRODUCTION

Nurse is one of medical staff in hospitals who give medical services to support the treatment of patients. Nurses as a medical staff in hospital have a high work demand on their role in the hospital. This high demand of work can affect their workload. Factors that can affect the workload of nurses are the patient condition that is constantly changing, the average duration (hour) needed to give direct treatment to patiens that is more than the nurse's ability, also the documentation of nursery care[1].

A workload arises from an interaction between a call of duty, the work environment, skill, behavior, and perception of the duty. Workload also can be defined operationally on several factors such as the task demand or the performed effort to finish the task[2]. Workload is not only on physical form, but also in mental one. Physical workload such as the burden of lifting, carrying, maintaining, and pushing objects, while the mental workload such as the weight of performing mental activities and perceptual such as memorizing, searching, working under time pressure, and interacting with patients to explain about medical treatments.

The survey of Self-Reported Workrelated Illness (SWI) shows that nurses have a high prevelance of stress related to the work[3].

Job stress occurs in many workers in the health sector. The responsibility towards human on medical field cause workers more vulnerable to stress[4]. All of

profesional staffs in a hospital have a high risk of stress, but the nurse have a higher risk of stress[5,6].

In general, hospital treatment consists of an inpatient care unit and an outpatient care unit. In outpatient care unit, a nurse is responsible to assist the doctor on preparing the tools, measuring patients body weight, measuring patients blood pressure, and provide the needed medicines during the treatment. They work under the instruction of the doctor.

The frequency of meeting between nurses and patients in outpatient care unit is lesser than the nurse of inpatient care. The nurse in outpatient care meets the patient on the day of check-up only, then the nurse more often meets with the doctor who checks the patient. Common problems faced by the nurses in outpatient care unit are explaining about the medical services to patients and also handling the complaint from the patient about those services, administrative work, the doctors who come late and leave early. All of those things can become a source of stress for the nurses.

Nurses in Jimma Hospital, Ethiopia, who work in outpatient care unit experience a stress higher than the nurse from other units, and the major sources of that stress is the workload[7]. Another research on 40 nurses in outpatient care shows that 55% of nurses experience stress at medium up to high level, and the most determining factor of that stress is workload[8].

Recent studies have shown an association between individual characteristic, mental workload and job stress in nurse at outpatient unit. Hence this study was aimed to assess the association of job stress among nurse at oupatient unit and to investigate the factors relating job stress and provide recommendation for preventing the risk factors.

MATERIAL AND METHOD

Participants

The present study was a cross-sectional analysis done among nurses at thirteen outpatient care unit of public hospital Surabaya during January 2017 provided written informed consent to complletion of a self administered anonymous questionnaire.

Full time nurses (n= 26) were selected by using a total sampling method. Inclussion criteria were as follows: the subject should be working in the current job for at least six months. Permission from the respective organization for doing the study was taken.

Procedure

The following tools were used during the study: questionaire and calorimeter. Structured questionnaires were administered to obtain information about workload factors which causing stress in workplace. It consist of three sections of questions.

The first section requested for individual capacity like age, job section, and gender.

The second section requested for mental workload scales using the NASA TLX Questionnaire developed by The Human Performance Group at NASA's Ames Research Center. The questionnaire includes six mental workload scales regarding quantitative load (Physical workload, efforts, etc).

The third section was designed to assess Job stress using HSE Management Standards Indicator Tool Questionnaire developed by Health Safety Executive.

The study subjects were examined for their physical workload by using a Calorimeter heart rate watch.

Mental workload are classified according to the total average of weighted workload score from the answer of NASA TLX and job stress is classified according to total score of answer of the questionnaire into category of light job stress, medium job stress, high job stress, and very high job stress.

Data analysis

To know the level of influence of each risk factor to occurrence of job stress on the nurse at oupatient unit it is conducted to univariate analyze with the frequency distribution and crosstab, and analyze the bivariate with the test of logistic regression. The level of significance considered was 0.05. All analysis were conducted using the Portable SPSS PASW Statistics 18.0.

FINDINGS

Variable	Occurance of Job Stress				P Value	Odds Ratio
	Light (n=12)	Medium (n=14)	High (n=0)	Very High (n=0)		
Age (years old)						
36 – 45	6 (50%)	4 (28,6%)	0 (0%)	0 (0%)	0,989	
46 – 55	6 (50%)	9 (64,3%)	0 (0%)	0 (0%)	0,882	1,193
56 – 65	0 (0%)	1 (7,1%)	0 (0%)	0 (0%)	1,000	1E+009
Gender						
Male	4 (33,3%)	3 (21,4%)	0 (0%)	0 (0%)		
Female	8 (66,7%)	11 (78,6%)	0 (0%)	0 (0%)	0,225	6,681
Physical Workload						
Light	9 (75%)	12 (85,7%)	0 (0%)	0 (0%)		
Medium	3 (25%)	2 (14,3%)	0 (0%)	0 (0%)	0,809	1,460
Heavy	0 (0%)	0 (0%)	0 (0%)	0 (0%)		
Mental Workload						
Light	0 (0%)	0 (0%)	0 (0%)	0 (0%)		
Medium	0 (0%)	0 (0%)	0 (0%)	0 (0%)		
Slightly High	10 (83,3%)	2 (14,3%)	0 (0%)	0 (0%)		
High	2 (16,7%)	12 (85,7%)	0 (0%)	0 (0%)	0,005	39,539
Very High	0 (0%)	0 (0%)	0 (0%)	0 (0%)		

Occurance of Job Stress

The number of nurses in outpatient care unit of Public Hospital Surabaya who experience light stress is 12 respondents (46.2%), medium job stress is 14 respondents (53.8%), and there are no nurses who have a high or very high level of stress.

Workload is one of the stressor which can cause a stress to the respondent. The absence of respondent who experiences a high or very high level of stress even if there is a high stressor caused by the stress coping mechanism possessed by the respondent. The stressor at work environment wether can directly or indirectly affect the worker is depend on the coping mechanism performed by the worker, if the worker are unsuccessful on performing the coping mechanism, then it can manifest on the experience of job stress[9].

Age

This research shows that the majority of respondent who experience medium level stress is respondents in the age of 46-55 years old (64,3%). People at those age is classified in a middle adulthood group, and at this group of people have better awareness about things they can do to alter the condition of high stress and also have more effective strategy to prevent and minimize the stress[10].

The test of logistic regression shows that p value > 0.05, it means that the age variable has unsignificant effect on the job stress of the nurses of outpatient care unit. This research is similar to the previous research which shows that there is no significant relations between the age variable and job stress[11]. Job stress can be caused by other factors besides the age variable, a people who more mature is suppose to be have better control of their stress because they have a good social skill.

Gender

The research shows that respondents who experience medium level of stress are mostly women (78,6%). Both man and woman can experience stress, but the woman has higher possibility to experience job stress than man. The occurrence of stress on woman can happen because of the condition and the changes of their biological, psychological, and social aspects[12]. Besides, it can be caused by the fact that the woman emotions is more unstable than man[13].

Logistic regression test shows that p value > 0.05 which means that gender has no effect to job stress, this is because the good relationship among the nurses, especially on the female nurses. The nurses provide services for about an average of five hours a day and the three other hours used to perform the administrative works. When performing administrative work, female nurses able to communicate more freely even about the things unrelated to the work, this condition is supported by the amount of female nurses that is more than male nurse, so that female nurse feels a social support from their co-worker. That kind of social support is important and can contribute to the improvement of work performance and the decrease of job stress level[14]. In this research, there are other factors that can contribute to job stress besides the gender.

Physical workload

Job stress on medical staff, including the nurses, can be caused by many factors, one of them is overwhelming workload[15]. In this research, physical workload is defined by the amount of calory used by the respondents during the work. The respondents who exercise energy for about 100-200 kcal per hour is considered as a performing a light work, 201-350 kcal per hour is in medium category, and 351-500 is considered as heavy work[16].

In this research, the majority of respondents fall into light category and there is none who fall into heavy category, please see the table above for complete result. The statistic test result shows that p value > 0.05 which mean that the physical workload has no influence on the respondent job stress. Base on the observation result on the respondent, it is known that when provide services to the patient, respondent can perform their job by sitting because the task is administrative and considered as light physicial work. The respondent doesn't perceive light physical workload as a thing that can cause job stress.

Mental workload

Besides the physical workload, the mental workload also need attentions. Physiologically, mental activities look like a simple task which doesn't require much calory. But, from moral and responsibility perspective, it is clearly heavier than the physical activites because it actively exercising the brain than the muscle. In this research, there is no respondent who have light, medium, or very high mental workload.

The respondent who have high mental workload, the majority of them have medium job stress (85.7%), the regression test result shows that p value <0.05 which means that the mental workload can contribute to the respondent job stress. When in duty, a nurse need physical effort and mentally to finish their task[17].

Public Hospital Surabaya is one of teaching hospital in Surabaya city, in there we can find medical students who pursue their education. The presence of those medical students can give extra burden to the respondents because they have to give instructions regarding the procedures, there are times when the respondents have to clean up the medical tools and ensure their safety because it was left untidied by the students. The previous research shows that a teaching hospital is closely related to the workload of nurses because it give unfavorable effects on the nurses workload[18].

In this research, the respondent often performs administrative works, taking care of so many patients while the doctors themselves was busy so they cann't be punctual, those conditions can give adverse effects on the nurses because those can trigger the complaints from the patients to the nurses. Base on the interview with respondents, the other problems are staffs who late on delivering the patients medical record. This problem gives some kind of time pressure on the nurses since their time allocation for servicing the patients become less. The high mental workload in this research is the main factor that can cause stress on the respondents. Base on the previous research, it is known that nurses have high mental workload[19].

CONCLUSION

Age factor, gender, and physical workload are not affecting the occurrence of stress on the nurses in outpatient care unit in Public Hospital Surabaya. The most affecting factor is the mental workload. The respondents in this research have a slightly high and high mental workload, there is no respondent who have a light or very high mental workload.

The research result shows that the respondents who have high mental workload are 39 times more vulnerable to experience a medium job stress than the respondent who have a slightly high mental workload. The total amount of patient, the presence of medical students, the complaint from patient and also the time pressure are the mental workloads that cause stress on the respondent.

Therefore, respondents need to improve the cooperation among the nurses from other unit in order to make the work system more effective and efficient, to improve the social support among the co-worker, and to improve the commitment of all staff in the hospital to be more punctual on performing their duty.

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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Perceived Barriers for Utilization of Health Care System among Married Women with Gynaecological Morbidity in Udupi Taluk, Karnataka

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ABSTRACT

Background: Gynaecological morbidity has been defined as structural and functional disorders of the genital tract which are not directly related to pregnancy, delivery and puerperium. Reasons that prevent a woman to take treatment for her gynaecological symptoms may be vary according to individual. This study was aimed to determine the perceived barriers for utilization of health care system among married women with gynaecological morbidity of reproductive age group in Udupi Taluk, Karnataka. **Material and methods:** A descriptive cross sectional survey was conducted. Sample of 330 married women in the reproductive age group of 18 to 45 years were selected by purposive sampling technique and data was collected using baseline proforma and tool on barriers of utilization of health care system. **Results:** Results indicated that married women with gynaecological morbidity faces some barriers for utilization of health care system. Majority 73(92.4%) women believed that gynaecological symptoms are normal for women. The next major barrier identified was shyness 23(29.1%). **Conclusion:** Community health nurses should take up necessary actions to solve the barriers as solved barriers will motivate married women to initiate their treatment from health care system and will promote effective utilization of the health services in order to achieve optimal health.

Keywords: *prevalence, gynaecological symptoms, reproductive age*

INTRODUCTION

Gynaecological morbidity has been defined as any conditions, disease or dysfunctions of the reproductive system which is not related to pregnancy, abortion or childbirth, but may be related to sexual behaviour[1, 2]. From the onset of puberty to the post menopausal period, most women experience one or the other symptoms gynaecological morbidity. Eventhough these symptoms have negatively affected their reproductive life as well as daily activities, they rarely reports to health care system. A married woman in her reproductive age will give priority to health of their children, husband and other family memebers over their own. they will neglect the symptoms/problems and will not seek any health care services due to several barriers. Health seeking behaviour is based on how women view their own health status as well as how they experience each symptoms of gynaecological morbidity. Purposeful ignorance of the symptoms of gynaecological problems by the married women is a major factor to raise the complication of gynaecological morbidity and it leads to mortality of women. Most of the Indian women are not ready to take self-decisions on their treatment.

Lack of awareness of the effect of gynaecological morbidity on the health and quality of life of women is evident at national, community and individual level. Women's lack of knowledge or awareness may not only the reason for failure to seek treatment. Reasons that prevent a woman to take treatment for her gynaecological symptoms may be because of cultural factors, geographical factors, financial factors, fear and personal factors.

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A community based cross sectional study was conducted among young married women in rural area of Thiruvarur district of Tamil Nadu state in India and revealed that the reasons for not taking treatment for reproductive tract infections and sexually transmitted infections were perceptions of symptoms as normal, feeling shy, lack of female health workers, distance to health facility and lack of availability of treatment[3]. A study conducted in Lalitpur district, Nepal reported that,39% samples did not take any treatment from health system, whereas 61% samples took treatment from health system. Majority of the respondent 71% reported shyness as a reason for not seeking treatment immediately after experiencing the problem[4].

This study aimed to determine the perceived barriers for utilization of health care system among married women with gynaecological morbidity, that prevent a woman to expose herself to the health personals for treatment of gynaecological symptoms and for those who have not taken any treatment for their symptoms, motivate them to take treatment from health care services. This study would be helpful to create awareness regarding gynaecological morbidity and thus it will help in reducing gynaecological morbidity in women and make them have a better quality of life.

MATERIAL & METHOD

Descriptive cross sectional survey was conducted among 330 married women in the reproductive age group of 18 to 45 years residing in selected villages of Udupi District, Karnataka. Udupi district has 3 Taluks-Udupi, Kundapura and Karkala. Udupi Taluk was selected conveniently. Six villages were selected randomly from Udupi taluk. Purposive sampling technique was used to select the samples. Sample calculation was done by using formula Pretested questionnaire was used to collect the data. Background data and symptoms of gynaecology problem were collected from 330 married women. Dichotomous questionnaire on barriers of utilization of health care system was administered to 79 women who had not sought any treatment for gynaecological morbidity to identify the barriers for the not taken treatment.

Ethical approval

The research was approved by the Institutional Ethical Committee (IEC) Kasturba hospital, Manipal University (IEC 827/2015) and permission was obtained from Thasildar of Udupi District to conduct the study.

Written consent from women. The respondents were given an explanatory statement of the study and consent was obtained. The privacy and confidentiality of each respondent was maintained and the respondents were given the rights to withdraw from participating in the study.

Data analysis techniques

Data was analysed with Statistical Package for Social Sciences (SPSS) version 16. The respondents' demographic data and barriers for health care system were analysed by descriptive statistics

RESULTS

The samples included 330 married women in the reproductive age group of 18-45 years. Study result revealed that majority 86 (26.1%) of the study population belonged to the age group of 41-45 years. More than half of the women 271(82.1%) were belonged to Hindu religion and majority 151(45.8%) had completed high school education. Most of the women 273(82.7%) were housewife.

Among 330 women, 219 women reported at least one symptom of gynaecological morbidity. In that 140 (63.9%) had sought some form of treatment, while 79(36.1%) had not sought any treatment. Barriers for not soughted any treatment among 79 married women with gynaecological morbidity presented in table 1

Table 1: Frequency and percentage of perceived barriers for utilization of health care system n=79

Barriers	Frequency	Percentage
Perceived that these symptoms are normal for women.	73	92.4
Health care facility is too far from home	2	2.5
Lack of money	15	19
High cost of service	15	19

***Cont...* Table 1: Frequency and percentage of perceived barriers for utilization of health care system n=79**

Fear of complication	5	6.3
Fear to get admitted in the hospital	5	6.3
Fear of test result	3	3.8
Fear of doctors	4	5.1
Can`t bear the pain of the procedures.	5	6.3
Unavailability of female doctors	4	5.1
Objection from husband or from family members	2	2.5
Lack of time to go for consultation	6	7.6
Don't have much idea about the health care services	3	3.8
Don't know much about this present condition.	7	8.9
Cannot understand the physicians language	11	13.9
Shyness	23	29.1
Don't know how to explain these symptoms	22	27.8

The data presented in the table 1 shows that 92.4% women believed that these gynaecological symptoms are normal for women and 29.1% women expressed that feeling shy to seek treatment for gynaecological problem. Twenty two (27.8%) women did not know how to explain these symptoms to physician. Lack of money and high cost of service were the other barriers identified 15(19%). Eleven (13.9%) women did not take treatment because they did not understand the physician's language.

DISCUSSION

According to a study done in Thiruvarur district of Tamil Nadu state[3] found the reasons for not taking treatment for reproductive tract infections and sexually transmitted infections were perceptions of symptoms as normal, feeling shy, lack of female health workers, distance to health facility and lack of availability of treatment. A study done in Lalitpur district, Nepal[4] found that majority of the respondent (71%) reported shyness as a reason for not seeking treatment immediately after experiencing the problem

A cross-sectional study was conducted in Hubli, Karnataka. Among 119 women who had not sought treatment for their symptoms, majority of women 95 (79.8%) gave reason that, it will cure by itself, 15 (12.6%) did not give any response, while 9 (7.6%) told that, they did not have time to seek health care[5].

In an article regarding the health seeking behaviour and health service utilization in Pakistan, discussed the factors which cause poor utilization of primary health care service. This paper concluded that to have a positive impact on health seeking behaviour, we have to raise the socio-economic status of women through multi-sectorial development activities such as women's micro-credit, life skill training & non formal education, develop gender sensitive strategies and programmes, organize public health awareness programme and employ more female health workers[6].

A cross sectional survey was conducted to find out self- perceived gynaecological problem, knowledge and utilization of health services as well as reason for not seeking the health care among married women of reproductive age group in the rural area. The major reasons mentioned by women were personal (68%) which includes lack of time (48%), loss of wages (12%), inability to go alone (23.2%) and no family support (6.3%). The second most reason mentioned by women was inadequate facility (13.4%) which includes PHC/CHC is too far (1.6%), unavailability of female doctors (1.8%), no privacy (2.4%) and lack of medicines (10.1%)[7].

An editorial discussed about health seeking behavior in context. It says that treatment seeking behavior is related to client based factors, provider based factors, social factors, demographic factors, cost, social network and biological signs and symptoms. According to determinant models, health seeking behavior has connection with level of education, occupation and income of the head of family. It also noted that underutilization of modern health care services is rarely due to the influence of local beliefs[8].

CONCLUSION

The above study clearly indicates that the attitude or believes of married women towards gynaecological morbidity is negative. The major reasons that prevent a woman to take treatment for her gynaecological symptoms were they perceived that the symptoms of gynecological morbidity are normal for women and feeling shy. We nurse can provide counselling to community women about the treatment seeking behaviour and how to overcome the barriers which hinder them to utilize the health care services.

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Conflict of Interest : Nil

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Tubercular Carditis and Pericarditis – An Autopsy Study of Heart in Sudden Death

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ABSTRACT

Introduction: Tubercular pericarditis which accounts for a tenth of all patients hospitalized for heart failure is important to recognize because it is a potentially curable cause of heart disease.

Aims and objectives: To know the cause of sudden deaths in hospitalized patients

Result: Tuberculous pericarditis was found in 5 cases and tuberculous carditis was found in one (1) case in 20 (1997-2016) years autopsy study of hearts in sudden death in our Institute. Nearly 1500 cases of hearts were studied in sudden deaths, tuberculous pericarditis was seen in 0.33% of cases and tubercular carditis in 0.07% of cases.

Conclusion: The rarity of this entity is attributable to effective drugs against tuberculosis.

Keywords: *Tuberculosis; Pericarditis; carditis.*

INTRODUCTION

Heart disease is still dominated by non ischemic causes such as rheumatic heart disease, hypertensive heart disease, cardiomyopathy and TB related conditions such as tubercular pericarditis and cor-pulmonale. Tubercular pericarditis which accounts for a tenth of all patients hospitalized for heart failure is important to recognize because it is a potentially curable cause of heart disease. Isolated tubercular myocarditis is extremely rare, particularly since the introduction of drugs against TB[1]. Most cases of myocardial TB are clinically silent and are diagnosed only at autopsy. Tuberculous pericarditis is found in 1% of all autopsied cases of TB and 1-8% of cases of pulmonary TB. It is increasing as a result of human immunodeficiency virus (HIV) epidemic and this trend is likely to occur in other parts of the world where spread of HIV is leading to resurgence of TB[2]. Tuberculous pericarditis is a serious form of extra-pulmonary TB associated with substantial morbidity (cardiac tamponade and constrictive pericarditis) and death during treatment for TB. Recent studies indicate that tuberculous pericarditis is associated with a mortality of 20% which rises to 40% in immunosuppression[3].

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MATERIALS AND METHOD

The present study was conducted at the department of pathology, KIMS, Hubballi, a tertiary teaching hospital located in north Karnataka. All the sudden deaths which happened in hospital from 1997 to 2016 were included in the study. In 20 years (1997-2016) nearly 1500 hearts were studied for sudden deaths in our institute. All the hearts were dissected according to line of blood flow and sections were stained with Hemotoxyline and Eosin, sections of heart and pericardium with tuberculosis showing foci of caseous necrosis and granulomatous inflammations were subjected for special stains (AFB) and were found to be negative in all cases.

RESULTS

A total of 1500 hearts were studied over a period of 20 years from 1997 to 2016. 37.6% were in the age

group of 40-49 years, followed by 26.8% in 30-39 years age group. Only 0.5% of subjects were observed in 10-19 years. Male subjects constituted about 59.2%, while female 40.2% (Table-1). Tuberculous pericarditis was found in 5(0.33%) cases and tuberculous carditis was found in 1 (0.07%) case. The age of tubercular pericarditis cases ranged from 12-35 years with male: female ratio of 2:3. Tubercular pericarditis was found in 30 year male patient. The pericardium in tubercular pericarditis show ragged surface with areas of caseous necrosis and fibrinoid granular surface lining (fig-1). The heart in tubercular carditis show well defined foci of chalky white caseous necrosis in cut section of ventricular surface (fig-2). This patient was having miliary tuberculosis histologically in liver, kidney, and lungs. The sections from pericardium show areas of fibrinoid material with areas of fibrosis, infiltration of chronic inflammatory cells and caseous necrosis (fig-3). The sections from heart show well defined langhans giant cells with areas of chronic cell infiltrate and myonecrosis(fig-4).

Table 1: Age and sex wise distribution of study subjects

Indicators	**Number**	**Percentage**
Age(in years)		
10-19	07	0.5
20-29	53	3.6
30-39	401	26.8
40-49	564	37.6
50-59	388	25.7
60 and above	87	5.8
Sex		
Male	889	59.2
Female	611	40.8
Total	1500	100

DISCUSSION

Tuberculosis is an important cause of pericardial disease and Tubercular pericarditis caused by Mycobacterium tuberculosis is found in about 1% of all autopsied cases of TB and 1-2% of Pulmonary TB[4]. In India, TB is responsible for nearly 2/3 of the cases of constrictive pericarditis[5]. Overall TB accounts for 60-80% cases of acute pericarditis in the developing countries and developed world. TB is relatively rare cause of pericardial disease in HIV negative, immunocompetent persons and accounts for 2% cases of acute pericarditis, 2% of cardiac tamponade and 0-1% of constrictive percarditis[6].

Pericardial involvement usually develops by a retrograde lymphatic spread of mycobacterium tuberculosis from peritracheal, peribronchial or mediastinal lymph nodes or by hematogenous spread from pulmonary tuberculous infection[7]. The pericardium is frequently involved by breakdown and contiguous spread from tuberculous lesion in the lung or by hematogenous spread from distant secondary skeletal or genitourinary infection. The immune response to the M tuberculous bacilli penetrating the pericardium is responsible for the morbidity associated with tuberculous pericarditis. Protein antigens of bacillus induce delayed hypersensitivity responses, stimulating lymphocytes to release lymphokines that activate macrophages and influence granuloma formation. The cytrokine profile suggests that tuberculous pericardial effusions arise as a result of a hypersensitivity reaction orchestrated by the T helper type I lymphocytes. The demonstration of complement fixing antimyolemmal and antimyosin type antibodies in 75% of patients with tubercular pericardial effusion has been cited as possible evidence that cytolysis mediated by antimyolemmal antibodies may contribute to the development exudative tubercular pericarditis[8].

Four pathological stages of tuberculous pericarditis are recognized[9].

1. Fibrinous exudation with initial polymorphonuclear leucocytes, relatively abundant mycobacteria and early granuloma formation with loose organization of macrophages and T cells.

2. Serosanguineous effusions with predominantly lymphocytic exudates with monocytes and foam cells.

3. Absorption of effusion with organization of granulomatous caseation and pericardial thickening due to fibrin, collagen and ultimately fibrosis.

4. Constrictive pericarditis**:** The disease may progress sequentially from stage I-IV stage or may present as any of the stage. The factors that lead to a dominant exudative inflammation in some patients or fibrosis in others not known[10]. While acute pericarditis

appears to be a primary hypersensitivity response to tubercular proeteins. Chronic effusion and constriction reflects granuloma formation and fibrosis. Epitheloid granulomas, langhans giant cells and casation necrosis are evident on histopathological examination[11]. The T lymphocytes, in addition to activated macrophages are important in granuloma formation. The accompanying exudative pericardial fluid may contain polymorphonuclear leucocytes in the initial 1-2 weeks, but later on it is predominantly lymphocytic with high protein content. In 80% of the cases the fluid is straw coloured or serosanguinous and may grossly bloody resemble venous blood at times[4], very rarely severe inflammation may result in pyopericrdium due to TB and fluid may vary from 15-3500ml[12]. The pericardial fluid when aspirated may show acid fast bacilli in auramine-rhodamine fluorescent stained smear. Pericardial biopsy is useful to provide histologic confirmation. Pericardial fluid adenosine deaminase levels are diagnostic for tuberculous pericrditis if > 50 u/l[13].

The typical onset is insidious with symptoms of low grade fever, night sweats, weight loss, malaise, dyspnea and chest pain. Most patients have positive mantoux skin test.

In the last stage, the fibrosing visceral and parietal pericardium contracts on the cardiac chambers and may become calcified encasing the heart in fibrocalcific skin which impedes diastolic filling and causes the classical syndrome of constrictive pericarditis. Recent data suggests that the histological pattern is affected by the immune status of the patient, with fewer granulomas being observed in HIV infected patients with severely depleted CD4 lymphocytes[14]. The lymphatic drainage of the pericardium to the anterior and posterior mediastinal and tracheobronchial lymph nodes is reflected by the pattern of lymphadenopathy seen in tuberculous pericarditis. The mediastinal node enlargement of tuberculous pericarditis effusion is not visible on routine chest radiograph but can be seen on computed tomography(CT) or magnetic resonance imaging(MRI)[15.] In other conditions associated with mediastinal lymph node involvement, such as lymphoma malignancy and sarcoid, hilar lymph node involvement is prominent. Cardiovascular involvement is a relatively uncommon manifestation in patients with tuberculosis and has been described in 1-2% of patients[4.] It mainly affects pericardium, but very rarely myocardium, the valves and large arteries are involved. Although cardiovascular involvement is always secondary to TB elsewhere in the blood, it may the only clinical manifestation of TB. Mycobacterium tuberculosis is the usual infecting agent. Cardiovascular TB caused by non tuberculous mycobacteria has been documented in patients with human immunodeficiency virus infection[16].

In chronic cases the inflammatory process may extend into myocardium resulting in myonecrosis and muscle atrophy. The constriction at times may be patchy and localized to certain areas.

MYOCARDIAL TUBERCULOSIS

Myocardial tuberculosis is very rare[17]. In patients with diffuse cardiac TB, myocardial involvement occurs but is overshadowed by the diffuse involvement. Nodular myocardial TB can sometimes produce a tumor like granulomatous mass causing right atrial or right ventricular obstruction. Caseation necrosis of myocardium causes aneurysm in subatrial or left ventricular anterior wall. Occasionally, a lymphocytic myocarditis with demonstration of Mycobacterium tuberculosis has been described in patients with TB[17]. Coronary arteritis from TB occurs infrequently in patients with TB pericarditis.

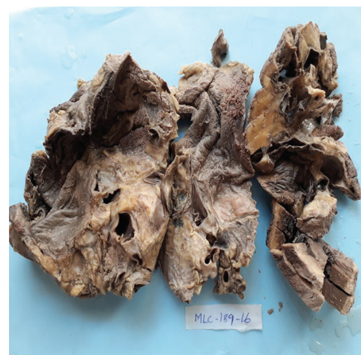

Fig1. Specimen of pericardium showing granular serosanguinous lining with areas of caseous necrosis.

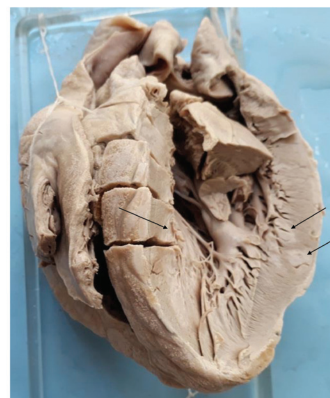

Fig2. Specimen of heart showing gray white caseation on lateral middle 1/3 of ventricular surface

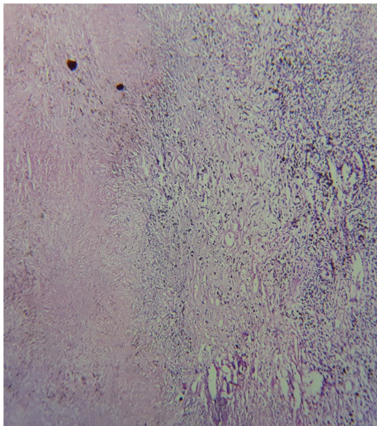

Fig3. Section of pericardium showing caseous necrosis, chronic inflammatory cell infiltrate with areas of fibrosis.

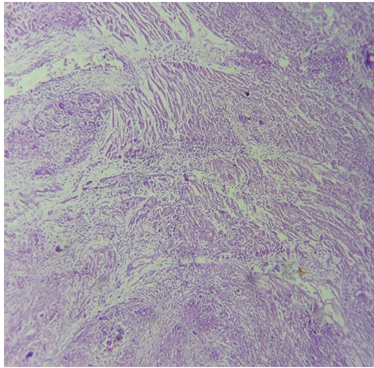

Fig4. Section of myocardium showing myonecrosis, langhans giant cells and chronic inflammatory cell infiltrate with areas of fibrosis.

CONCLUSION

It was observed that Tubercular pericarditis and Tubercular carditis were rare findings in cases of sudden deaths due to Tuberculosis in North Karnataka. TB pericarditis was found in 0.03% and TB carditis in only 0.07% cases. The rarity of this entity is attributable to effective drugs against tuberculosis.

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Conflict of Interest: None declared.

Ethical Clearance: Not needed as we are presenting this study based on medico-legal autopsy.

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Emotional Intelligence and Juvenile Delinquency: A Nexus with Crime

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ABSTRACT

The present study is based on emotional intelligence and juvenile delinquency of a child which fertile to procure and deliver a crime in the society. A man is not born criminal but the surrounding circumstances build the man to commit a crime. Different factors like parent child relationship, education, surroundings and standard of living are the few reasons for the juvenile delinquency. The behavioral changes of a juvenile also depend on its physical and mental status. Emotional intelligence is one such ability in which emotions of a human being can be managed or fabricated to use it in necessary or an evil path respectively.

Keywords: *emotional intelligence (EI), juvenile delinquency, offender, behavior, crime*

INTRODUCTION

The usefulness of EI has been felt in various facets of human life & its influence on quality of life, social interaction has been evident through past researches. Individuals equipped with strong EI are full of achievements, better at human relations, more prudent, extremely conscientious hence proved to be better human beings as they can very well recognize their own & others emotion & manage them to facilitate the thoughts. Definition of EI also conveys the same that human being posses an ability through which he/she can know the emotions of their own & others so that it can be managed & manipulated to be used productively & can be converted into thoughts [1](Mayer, Caruso & Salovey, 2002; [2]Goleman 1999). Thus it is affirmed that at the very primitive stage children are required to gradually gain knowledge of emotions & its productive results because emotion not only helps in career building but also helps to have balance personal life by enhancing rational decision making, stress management etc. [3](Masoumeh & Mansor et al., 2014). Further more infusing EI as early as possible makes the young ones to be better human beings later.

Juvenile is a person who has not completed the age of 18 years. But according to Juvenile Justice (Care and Protection of Children) Act, 2015, the juveniles in conflict with law between the age from 16 to 18 and involved in heinous offences and crime defined under the Indian Penal Code, 1860, can be tried as adults even though they have not attained their adulthood. This stringent rule enacted by the parliament after the Nirbhaya case (2012), Delhi where a juvenile being the serious offender released from the jail due to the old and inappropriate law. Being a juvenile majority of biological & psychological development have been monitored during infancy but socio-psychological, behavioral & emotional development has been noticed during adolescent due to the influence of friends, family, acquaintances etc. Many a times these changes lead to doing some serious offences in the society. Few hereditary & environmental factors combinely affect adolescent behavior to be deviated or socially accepted. Hence there can never be behavioral changes without the interventions environmental. Investigation says that most of the kids become adult without showing any counterproductive behavior. It has been observed that majority adult criminals once upon a time were caught up in deviated behavior. Whereas it is also recorded that juvenile showing antisocial behavior & juvenile criminals can be grown to better human beings morally & ethically if they get emotional guidance & supervision.

REVIEW OF LITERATURE

Chong & Lee et al., [4](2015) took 300 samples of

students aging 15 to 18 years to assess the connection between EI & delinquent behavior & found that students with lower EI showed extremely delinquent behavior such as misconduct subsequently leading to involvement in criminal activities, untruthfulness, sexploitation, trashing & substance abuse. High EI, especially self awareness of emotions really helps the students to stay away from such behavior. Strong emotionally equipped students do not show such orientation. Suggestion made by the author was that identifying emotion & skillfully managing it surely would reduce delinquent behaviors.

Silsby & Jessica [5](2012) studied in Mexican sample & noted that looking at the acute increase of juvenile delinquent activities, it is very essential to empower students emotionally to protect their disruptive emotions.

Prakash & Sharma et al., [6](2015) mentioned that alcohol abused people often exhibits lowest EI which causes personality disorder leading to destroyed social life & spoilt relationship.

According to the report of International Society for Clinical Densitometry (ISCD) 2010, alcohol is the most deadly drug causing harm to self & others in the society.

Megreya [7](2015) documented that EI varies rather declines according to the degree of crime brutality. More the serious offence lesser is EI.

Not only EI have all brighter consequences such as accomplishment of successful career, fulfilling life but EI also pays off negatively, Davis & Nichols[8] (2016) termed it as the dark side of EI. The negative effect can also extremely damaging in nature causing personal, professional & academic devastation like ill mental health, stress sensitivity (internal) & unsociable behavior, emotional exploitation (external).

Liau & Liau et al., [9](2010) talked about emotional literacy of Malaysian school students where it is mentioned that EI ought to be included in the pedagogy so that the erotic behavior of students can be controlled from an early stage to prevent internalizing behavior such as social withdrawal followed by isolation, emotional distress & externalizing behavior like bullying, arson etc. Parental vigilance also has got an influence on above behavior of adolescents.

Bacon, Burak & Rann[10] (2014) demonstrated that male adolescents who are not adequately equipped with emotional self regulation, emotional awareness & emotional management tend to show more socially deviated behavior. In case of females high EI reported higher delinquency.

Park [11](1999) discussed that young people should be helped to enlarge the level of emotional understanding so as to get motivated for learning & increase general responsiveness by engaging budding minds. It may indicate that as the young minds are very raw in nature, any negative learning & teaching can get intensify in the brain leading to subsequent germination.

Petrides & Frederickson et al., [12](2004) illustrated after studying upon 650 British school students that with higher EI reported lesser unauthorized absenteeism of students which may implicate that students who are more emotionally intelligent are found to be keen to their studies. In addition, it might also indicate that better EI facilitates judging between right & wrong deeds.

Moriarty & Stough et al., [13](2001) compared EI of sex offenders with non offenders of 14 -17 years of age & found that offenders showed significantly low EI because of their higher hostility & they were overtly attentive to their feelings as well as inability to repair the obnoxious mood than their counterparts. That means if juveniles could have been scarcely emotionally intellectual, they would have saved themselves from committing crimes.

Masoumeh & Mansor et al., [14](2014) mentioned that EI had a significantly negative relationship with aspects of aggression like physical & vocal aggression, antagonism, hostility which means adolescents possessing high EI were having low level of aggression. Low EI scorer adolescents were more potent to throw indecent comment about teachers & did not mind doing offensive gesture towards their fellow mates. It can be assumed that these mischievous acts can further facilitate to commit bigger mistakes which may not be forgiven later.

As per Harris & Ogbonna [15](2002) conveyed that individuals having less EI often seen with absolutely low moral values by virtue of this they often end up with misconducts which also applicable to adolescents.

A study conducted by (Gecas & Schwalbe, 1986)[16] and found that during the adolescence period they experience many changes in life and the parents plays pivotal role at this stage of their life. The children want

more care and importance from the family which usually filled with many gaps. In earlier the children remained physically and psychologically dependant on their parents but now it has to be more dynamic and modern approach be made in their personal space and freedom to take decisions towards their life endeavour.

(Stattin & Kerr, 2003)[17] projected that Support and caring stands as a backbone of parent child relationship. The adolescent's behaviour, interest for work and activities can be enhanced by the maximum efforts of their parent's.

According to (Goleman, 1995)[18] the youth will be emotionally competent, independent, smart, responsible and competency for social inclusiveness increases when their family members create such emotional bonding environment and provides adequate communication between them.

Mehta (1995)[19] in his article pointed out that warm and healthy relationships shared by parents and children resulting in building social and emotional abilities which gets a benefit of gaining suggestions making of parents, ideas, and a sense of security.

In, Satto v. State of Uttar Pradesh,[20] (1979) Justice V.R observed that the constitutional root of juvenile justice has been embodied in arts. 15(3) and 39(e) of the constitution of India and the State is directed for its child citizens including juvenile delinquents to make some provisions. The penal provisions of India with regards to the reformatory theory now prevalent in civilised criminology, and it has to approach the juvenile in conflict with laws or the child offender not as a target of rude punishment but of humanly nourishment. It is the main problem of sentencing rules when juveniles are found guilty of delinquency.

In Sheela Barse v. Secretary, Children's Aid Society,[21] (1987) Chief Justice Bagavathi said that, a child develops its root like a young plant which is placed in the environment. It may has a good breed but if the sapling is placed in a wrong way or a place unwarranted then, there won't be any desired development of the plant and it is very identical with a human child.

The Preamble of the UN Declaration of the Rights of the Child 1959 states that, "the child, by reason of his physical and mental immaturity, needs special safeguards and care, including appropriate legal protection, before as well as after birth, and that mankind owes to the child the best it has to give"

The (Proverb 22: 6 Bible) preach that "train a child in the way he should go, and when he is old he will not turn from it."

Reasons for Juvenile Delinquency:

There are different reasons for the Juvenile delinquency in India, but if we will see closely, mainly it is of three types

- Biological
- Socio- Environmental
- Psychological and Personal

Biological Reason

These kinds of reasons are mostly due to the health aspect of the child because all children are not blessed by almighty, that they born healthy. There are instances where ocular ailments, Speech problem, Hearing problem, Enuresis, Headache, Irritation, Hypoglycemia causing the children or juvenile delinquent in their behavior. Inadequate efficiency normally weakens and puts adverse effects on their ability to work as a result they dependant on others which may lead to antisocial behavior. Gradually inferiority complex develops and it leads a mind to commit criminal acts in the society. According to Wolfgang[22], most of the assaultive offences are committed by young offenders and they are under the age 18 years and late teen agers. It is also observed that the juvenile delinquents involved in the serious offences like riots, dacoity, murder and rape.

Socio-Environmental Reason

According to Sutherland[23], the juveniles' criminal behavior solely influenced and inherited from the family background. Socio- environmental reasons causes crime inflation in the society. There are factors like migration of families, cultural conflicts, the background of the family, the structure of the family, broken homes, divorce between parents, poor parent child relationship, excessive punishment to child, alcohol consumption by the parents, continuous quarrel between parents and other family members, neighborhoods, economic and financial conditions of the family aggravates the juveniles committing offence in the society. Inadequate education with family members or with children

contributes a lot for increasing crime by the juvenile offenders. However the living style of people in the society also adds a cause for juvenile delinquency. The standard of living in urban is totally different standard of living in rural areas. It is also different in terms of education, occupation, and interpersonal relationship with each other. Today the social status of any individual is measured by the one instrument called money. The crimes in much high profiled society are covered up by money and the poverty contributes a significant factor in commissioning a crime by the juveniles.

Psychological and Personal- Emotional

Emotional mal adjustment and mental problem are the vital reasons for juvenile delinquency. The mental troubles and emotional maladjustments are strong factors in the delinquency. Dr. Nathaniel Hirsch[24] observed that in America 65% of juvenile delinquent suffers from mental instability. Company with group or neighbor if not healthy, should be restricted. A children's mental condition, peculiarities to capabilities plays an important part in the formation of delinquent behavior. It has also been observed that an intelligent child commits crime with clean hands. Schooling, friend circle and other association where a child spends more time need to be monitored strictly from getting spoil.

Preventive measures for Juvenile Delinquency:

The Supreme Court of India directed a guideline in Vishal Jeet v Union of India, (AIR 1997 SC 699) that, "the state Governments and all Union Territories for eradicating the evil of child prostitution and for evolving programmes for the care, protection, treatment, development and rehabilitation of the young fallen victims." The Juvenile Justice Act 2015, in its preamble itself envisages that, "the need of the child care by providing that it is an Act to consolidate and amend the law relating to juveniles in conflict with law and children in need of care and protection, by providing for proper care, protection and treatment, by catering to their development needs, and by adopting a child-friendly approach in the adjudication and disposition of matters in the best interest of children and for their ultimate rehabilitation through various institutions established". The preventive measures also constitute welfare community organization, child care agencies where they can be given educational and vocational training. It also extends to probation and parole services.

CONCLUSION

In the words of Lord Krishna (Bhagwat Gita) "do not hate criminals, but hate crimes". Moreover, reformative theory has to be applied for such criminals in order to check the mental conditions and the status of their wellbeing. As emotions sharpens human personality & behavior by generating many other positive attitudes, it is understood that young minds should be fed good substances i.e identifications & utilizations of own & others emotions. In order to keep those young minds on track it is strongly recommended that adolescents belonging to primary & high schools should be taught EI. In addition to that all of us are required to behave little socially responsible towards adolescents. Inculcating EI at its earliest can help adolescents to become better individuals as they grow older because the time between beginning of education to the mid of education will determine the juvenile delinquent behavior. The more social responsibility of a child, the more will be the success and positivity towards its life endeavor.

Ethical Clearance- Not Required. As the present research is based on theories and studies undertaken by the various authors and doctrinally undertaken.

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Conflict of Interest- NIL

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Obesity, Lipid Profile and Inflammation: A Study of Adult Women of Low Socioeconomic Background from Mumbai City

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ABSTRACT

Obesity associated inflammation is an important mediator for obesity-associated non-communicable diseases (NCDs). The increasing prevalence of obesity in India, therefore is of concern. The present study aimed to examine the prevalence of obesity in apparently healthy women (n=1500) and examine the relationship between anthropometric indices, lipid profile and inflammatory markers. The prevalence of obesity was 43.6% by body mass index, 59.5% using percent body fat, 36.5% by waist circumference and 40.6% by waist hip ratio respectively. Mean serum triglyceride and high sensitivity C- reactive protein (hs-CRP) were significantly high in obese women. In obese women, hs-CRP significantly correlated with body mass index, waist circumference and percent body fat; whereas Interleukin-6 correlated with waist circumference and waist hip ratio. Therefore, with rising obesity, it is important to intervene in order to reduce the risks associated with obesity.

Keywords: *Indian women, Inflammation, Adiposity, Lipid profile.*

INTRODUCTION

Overweight and obesity are known to increase the risk of obesity- associated NCDs.[1] Globally, about 1.9 billion people were estimated to be overweight and 13% to be obese by the World Health Organisation.[2] India is experiencing rapid nutritional and epidemiological transition with obesity becoming a public health concern.[3] Under- nutrition due to poverty which existed in the past now co-exists with obesity in low socioeconomic groups thus exposing them to a double nutritional burden.[4]

Accumulation of fat in adipocytes leads to inflammatory condition.[5] About one-third of the Interleukin-6 (IL-6) concentration may be released by adipose tissue.[6] IL-6 increases hepatic production of CRP which is a good predictor of future development of cardiovascular disease in healthy individuals.[7]

Obesity is associated with dyslipidemia which is characterized by increased concentration of total cholesterol (TC), low density lipoprotein cholesterol (LDL-C), hypertriglyceridemia (TG) and decreased high density lipoprotein (HDL-C) present alone or in combination. It occurs due to uncontrolled release of free fatty acids from adipose tissue specifically visceral tissue through lipolysis.[5] In Asian Indians the prevalence of dyslipidemia ranges from 10% to 73%.[8]

The latest National Family Health Survey 4 (NFHS-4, 2015-16) showed that obesity has nearly doubled in the past 10 years in India. At country level, obesity levels increased from 13.92% in 2005-06 to 19.56% in 2015-16 amongst women.[9-11] However, NFHS-4 used a body mass index (BMI) of 25kg/m^2 whereas for Asian Indians the recommended cut off is 23 kg/m^2.[12] This suggests that the prevalence of overweight and obesity is likely to be higher than the figures reported. Therefore, the present investigation studied prevalence of overweight/ obesity in apparently healthy women residing in urban slums in Mumbai and in a sub sample we examined the

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lipid profile and analysed inflammatory markers.

MATERIAL AND METHOD

The study was approved by the Independent Ethics Committee (IEC/39/13), Navi Mumbai, Maharashtra, India. This cross- sectional study was carried out in selected urban slums of Mumbai city, Maharashtra, India. A total of 2500 women were contacted from which 1500 women who were eligible according to the inclusion and exclusion criteria were selected after obtaining written informed consent.

Only apparently healthy females (self- reported) between the ages of 21 and 45 years willing to participate were included whereas those on prolonged medication, suffering from chronic disease and those who were pregnant or lactating were excluded.

Anthropometric measurements

Each measurement was done three times and the average of three measurements was taken. Weight was taken using a calibrated digital weighing scale (Equinox, Model EB6171) with an accuracy of 0.1kg. Height was measured using non-extensible, flexible measuring tape which was calibrated against a standard anthropometric rod (accuracy of 0.1cm). BMI was calculated as weight/height^2 (kg/m^2).

Waist circumference (WC) and hip circumference (HC) measurements were taken using a calibrated, non-extensible, flexible measuring tape. Waist-to-hip ratio (WHR) was calculated.

Skin-folds at four sites: biceps, triceps, subscapular and suprailiac were measured on the right side of the body using Harpenden skin-fold callipers (Baty International; RH159LB, England). Percent body fat was calculated [13, 14].

Biochemical Investigations

Serum samples were obtained from a sub- sample of 200 women who consented to give blood. Venous blood (10ml) was collected in the morning after an overnight fast of twelve hours by a trained phlebotomist. Blood was centrifuged the separated serum samples were stored at -80 degree Celsius until analysis. TC, TG, HDL-C and LDL- C (mg/dl) were analysed using semi-automated enzymatic analyser (Transasia: ErbaSmartlab Automatic Biochemistry Analyser). hs-CRP (mg/L) was measured by enzyme linked immunosorbent assay (ELISA) (Diagnostic Biochem Canada Inc human ELISA kit). IL-6 and IL-10 (pg/ml) was measured by ELISA (DIAsource IL-6 EASIA kit, Belgium and Krishgen Bio Systems Cat. No: KB1072, India respectively).

Statistical analysis was done using SPSS software (version 20, SPSS Inc., Chicago, IL, USA). Student's t-independent test was used to determine whether there was a significant difference between groups. The subjects were classified into two groups (i) Normal (N) women having all the anthropometric measurements normal i.e. BMI<23kg/m^2, WC<80cm, WHR<0.80 and PBF≤30% and (ii) overweight/obese (Ob) women who were those with any one or more anthropometric indicator above the cut-off values i.e. BMI≥23kg/m2 OR WC≥80cm OR WHR≥0.80 OR PBF exceeding 30%. Analysis of Variance (ANOVA) and Pearson's correlation were used to examine associations. p values less than 0.05 were considered statistically significant.

RESULTS

Table 1 shows the mean anthropometric measurements and distribution of women within the age groups. The overall mean BMI (24.6±5.2 kg/m^2) and PBF (31.0±6.2 %) were above the normal cut offs. Overall mean BMI, PBF, WC and WHR significantly increased with increasing age. Based on BMI cut- offs, about 43.6% of the women were obese. 59.5% had PBF exceeding 30%. 36.5% had WC≥ 80 cm and 40.6% had WHR ≥0.80 (Table 1).

Table 1: Mean BMI, PBF, WC, WHR and Percentage of Women Obesity vis-à-vis Age Groups.

Anthropometric Measures	Classification	Total Mean± SD %(n)	Age Groups (in years) Mean± SD %(n)			F	P
			21-30 (n=648)	31-40 (n=584)	41-45 (n=268)		
BMI	Overall	24.6±5.2	23.2±4.8^{a}	25.4±5.2^{b}	26.3±5.3^{c}	**46.835**	**0.000**
	Underweight (<18.50)	17.3±1.0 11.9(179)	17.2±1.0^{ab} 7.9(119)	17.3±1.1^{bac} 3.3(50)	18.1± 0.3^{cb} 0.7(10)	3.578	0.030
	Normal (18.50-22.99)	21.0±1.2 29.1(437)	20.7± 1.2^{ab} 14.7(220)	21.0± 1.2^{bac} 9.9(149)	21.2± 1.2^{cb} 4.5(68)	4.358	0.013
	Overweight (23-24.99)	24.0±0.6 15.3(230)	24.0±0.6^{abc} 5.9(88)	24.1± 0.6^{bac} 5.9(89)	24.1±0.6^{cab} 3.5(53)	0.047	0.954
	Obese (≥25)	29.4±3.8 43.6(654)	28.7± 3.3^{ab} 14.7(221)	29.4± 3.9^{ba} 19.7(296)	30.4± 4.3^{c} 9.2(137)	9.105	0.000
PBF	**Overall**	**31.0±6.2**	**29.5±6.3^{a}**	**32.0±6.0^{bc}**	**32.5±5.4^{cb}**	**36.910**	**0.000**
	≤30	24.9±3.9 40.5 (608)	24.3±4.0^{a} 21.7 (325)	25.2±3.9^{b} 13.1 (196)	26.5±3.0^{c} 5.8 (87)	11.340	0.000
	>30	35.1±3.4 59.5 (892)	34.6±3.2^{ac} 21.5 (323)	35.4±3.5^{bc} 25.9 (388)	35.4±3.5^{cab} 12.1(181)	5.260	0.005
WC	**Overall**	**77.0±11.0**	**73.8±9.7^{a}**	**78.7±12.0^{b}**	**81.0±9.7^{c}**	**55.638**	**0.000**
	<79.99	70.4±6.1 63.5(952)	69.6± 6.0^{ab} 32.7(490)	70.5± 6.3^{ba} 22.3(335)	73.1± 4.8^{c} 8.5(127)	17.375	0.000
	≥80	88.4±7.9 36.5(548)	86.8± 7.0^{ac} 10.5(158)	89.7± 8.6^{bc} 16.6(249)	88.1±7.2^{cab} 9.4(141)	6.706	0.000
WHR	Overall	0.79±0.06	0.77±0.05^{a}	0.79±0.07^{b}	0.80±0.05^{c}	24.958	**0.000**
	<0.79	0.75±0.03 59.4(891)	0.75± 0.03^{ab} 29.4(441)	0.74±0.03^{ba} 22.1(331)	0.76± 0.02^{c} 7.9(119)	8.060	0.000
	≥0.80	0.84±0.05 40.6(609)	0.83± 0.03^{ac} 13.8(207)	0.85± 0.06^{bc} 16.9(253)	0.84±0.03^{cab} 9.9(149)	8.647	0.000

*Values with different superscripts are significantly different from each other within the age groups.

Table 2 shows the mean anthropometric and biochemical measurements in normal and obese women. Overweight/obese women in the age group of 31- 40 years had significantly higher mean TG as compared to normal women. Mean hs-CRP was significantly higher in overweight/obese women within all age groups (Table 2).

Table 2: Mean Anthropometric and Biochemical Variables in Normal and Obese Women.

Anthropometric Variables	**Overall Mean ± SD**		**P**	**Age Groups (in years)**								
				21-30			**31-40**			**41-45**		
	Normal	**Obese**		**Normal**	**Obese**	**P**	**Normal**	**Obese**	**P**	**Normal**	**Obese**	**P**
BMI	19.3 ±1.9	26.5 ±4.7	**0.000**	19.1 ±2.0	25.4 ±4.4	**0.00**	19.5 ±1.9	27.2 ±4.5	**0.000**	19.9 ±1.3	27.3 ±5.0	**0.000**
WC	65.4 ±4.8	81.1 ±9.6	**0.000**	65.2 ±4.7	78.3 ±8.5	**0.00**	65.1 ±5.1	82.8 ±10.4	**0.000**	67.3 ±3.2	83.0 ±8.7	**0.000**
WHR	0.74 ±0.03	0.80 ±0.06	**0.000**	0.74 ±0.03	0.79 ±0.05	**0.00**	0.73 ±0.04	0.81 ±0.07	**0.000**	0.75 ±0.02	0.81 ±0.05	0.000
PBF	24.1 ±4.0	33.4 ±4.8	**0.000**	23.8 ±3.9	32.4 ±5.2	**0.00**	24.3 ±4.1	34.3 ±4.3	**0.000**	25.0 ±3.5	33.6 ±4.7	**0.000**
Biochemical Variables	Normal (n=72)	Obese (n=128)		Normal (n=30)	Obese (n=34)		Normal (n=31)	Obese (n=63)		Normal (n=11)	Obese (n=31)	
TC	167.1 ±36.9	171.9 ±39.2	0.402	157.3 ±37.4	151.7 ±32.5	0.520	173.6 ±35.0	177.1 ±37.6	0.666	175.4 ±37.5	183.3 ±42.0	0.584
TG	101.2 ±58.0	126.9 ±66.6	**0.007**	103.2 ±66.5	121.6 ±62.2	0.269	91.7 ±46.1	124.1 ±62.6	**0.012**	122.6 ±51.9	138.4 ±79.1	0.542
HDL-C	64.7 ±22.4	65.4 ±25.2	0.853	61.4 ±21.0	63.0 ±21.0	0.763	66.9 ±24.4	67.4 ±26.4	0.934	67.5 ±21.0	63.9 ±27.2	0.692
LDL-C	87.1 ±30.4	94.3 ±35.6	0.152	83.1 ±31.1	84.3 ±31.9	0.886	93.0 ±29.5	99.2 ±38.3	0.437	81.3 ±29.9	95.3± 32.4	0.216
Hs-CRP	3.3 ±3.4	5.5 ±3.4	**0.000**	3.3 ±3.2	5.1 ±3.6	**0.036**	3.3 ±3.7	5.6 ±3.3	**0.004**	3.1 ±3.1	5.6 ±3.6	**0.047**
IL-6	29.2 ±31.0	26.6 ±23.3	0.508	24.6 ±17.6	30.1 ±25.9	0.336	36.4 ±41.9	26.0 ±23.9	0.131	21..2 ±18.4	23.9 ±18.8	0.679
IL-10	4.6 ±9.4	5.2 ±8.7	0.694	3.2 ±7.2	5.8 ±11.1	0.266	6.5 ±11.3	5.8 ±8.5	0.753	3.6± 9.0	3.2 ±5.5	0.860

***P values were based on independent student t-test.**

Table 3 shows the correlation between anthropometric measurements, lipid and inflammatory levels in overweight/obese women. A significant negative correlation was observed between HDL and IL-10 whereas LDL-C showed a significant positive correlation with IL-6. Similarly, hs-CRP showed a significant positive correlation with BMI, WC, PBF, IL-6 and IL-10. IL-6 significantly correlated with WC and WHR (Table 3).

Table 3: Correlation between Anthropometric Variables, Inflammatory Markers and Lipid Profile in Overweight/Obese Women.

Variables		**TC**	**TG**	**HDL-C**	**LDL-C**	**Hs-CRP**	**IL-6**	**IL-10**
BMI	r	0.116	-0.040	0.022	0.056	**0.313****	0.040	0.060
WC	r	0.162	-0.088	0.004	0.109	**0.271****	**0.177***	0.134
WHR	r	0.093	0.141	-0.030	0.144	0.089	**0.256****	0.069
PBF	r	0.155	0.058	0.128	-0.087	**0.336****	-0.128	0.007
TC	r	-	**0.363****	**0.424****	**0.432****	0.119	-0.103	-0.098
TG	r	**0363****	-	0.072	**0.259****	0.024	0.109	-0.039
HDL-C	r	**0.424****	0.072	-	**-0.230***	-0.021	-0.122	**-0.178***
LDL-C	r	**0.432****	**0.259****	**-0.230****	-	0.133	**0.262****	0.146
Hs-CRP	r	0.119	0.024	-0.021	0.133	-	**0.181***	**0.429****
IL-6	r	-0.103	0.109	-0.122	**0.262****	**0.181***	-	**0.473****
IL-10	r	-0.098	-0.039	**-0.178***	0.146	**0.429****	**0.473****	-

**. Pearson's Correlation is significant at the 0.01 level.

* . Pearson's Correlation is significant at the 0.05 level.

DISCUSSION

In the present study, using the BMI, WC, WHR and PBF, the prevalence of obesity was 43.6%, 36.5%, 40.6% and 59.5% respectively. The Phase I of the Indian Council of Medical Research–India Diabetes study on the prevalence of diabetes and related disorders observed that combined obesity (general and abdominal obesity) was highest in Chandigarh (26.6%) followed by Tamil Nadu (19.3%), Maharashtra (13.0%) and Jharkhand (9.8%).[15] Another study at national level, i.e. the NFHS 4 data showed that 14.5% of women were obese in Maharashtra.[9] In our study, the prevalence of obesity was higher than indicated by ICMR and NFHS-4. This may be because our data is confined to Mumbai city and the sample was recruited by snowball sampling. In the present study, prevalence of obesity was found to be more among older women. This may be due to decrease in skeletal muscle mass with age.[16]

Further, the present study found higher levels of serum TG and hs-CRP in obese women, a finding that is consistent with previous reports in the literature.[17,18] Obese women showed a strong and significant positive correlation between hs-CRP and BMI, PBF and WC whereas IL-6 correlated significantly with WC and WHR. Previous studies have also reported a positive association between IL-6, hs-CRP and BMI, PBF.[19-21] Weight loss has been shown to improve the inflammatory marker levels in obese subjects, through an increase of anti-inflammatory molecules.[22] In the present study, levels of IL-10 which is an anti-inflammatory were higher in the obese (5.2± 8.7pg/ml). Esposito et al., (2003) reported that the circulating levels of IL-10 are elevated in obese women whereas low levels of IL-10 are associated with the metabolic syndrome (MetS). [23] However, Calcaterra et al, (2009) reported IL-10 to be elevated (11.67 pg/ml) in obese children and adolescents but found no association of MetS with low IL- 10. [24] In the present study, women were not assessed for MetS, however; compared to the values reported by Calcaterra et al., mean IL-10 levels in the present study were approximately half. One possible reason could be that increase in age along with obesity, may reduce the capacity of producing IL-10 with an increase in risk for developing type 2 diabetes and cardio- vascular disease. Few of the animal studies have shown age- related decline in IL-10 levels, [25] however; this aspect warrants further investigations.

Some studies have shown a positive association between lipid levels and measures of adiposity,[8] whereas other studies have failed to detect such a relationship.[17] Age-wise increase in lipid profile was also evident in the present study. A previous study similarly reported that TC, TG, and LDL-C significantly increased while HDL-C decreased in women during menopausal transition period compared to women in younger age group which showed the possibility of changes in lipid profile due to hormones. [26]

CONCLUSION

Therefore, against the background of high prevalence of obesity in Indian women and increasing overweight burden to low socioeconomic groups, it would be important to intervene in order to address the emerging problem of obesity and to prevent development of NCDs.

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A Cross Sectional Study on Menstrual Pattern and Hygienic Practices amongst School Going Adolescent Girls in Urban Health Centre Practice Area

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ABSTRACT

Introduction: Myths and misconceptions related to menstruation are often associated with some degree of sufferings and embarrassment among adolescent girls. The present study was planned to find out the menstrual pattern among girls as well as their menstrual hygienic practices.

Methods: Cross sectional study done in private schools during July 2015 to Sept 2015.

Results: The mean age of menarche of the study participants was found to be 13 years 9 months. Around 17.3% girls had irregular menstrual cycles, 40.7% girls were suffering from dysmenorrhea and 34.7% were having backaches. Knowledge regarding menstruation was adequate in 37.3% girls, about 73.3% avoids social gathering and 54.3% were irregular to school during menstruation. About 16.7% of the students were not using sanitary pads. About 26 % girls were having good personal hygiene and 54.6% of participants felt shy watching advertisements regarding sanitary napkins in front of male members.

Conclusion: Our study concludes that the prevalence of menstrual irregularity, dysmenorrhoea led to absenteeism which affect the academics and quality of life of students. Awareness regarding menstrual hygiene was also found to be low. Low level of social participation was also seen during menstruation. Awareness programs involving school teachers is the need of the hour.

Keywords: *menstrual pattern, hygienic practices, adolescent girls, urban.*

INTRODUCTION

Onset of menstruation is one of the most important changes occurring during adolescence. In various parts of India, there are several cultural traditions, myths and misconceptions related to menstruation. It is often associated with some degree of sufferings and embarrassment. (1) It is a common observation that every woman does experience one or other type of menstrual problems in her lifetime. It is a usual occurrence that girls are rarely informed about menstruation before they experience it for themselves. It is mostly a traumatic one for most of them. If the girls are well informed about menstruation, well in advance, it will help them go through the same in a smooth way. Though there is a relative openness in the society as well as social marketing regarding use of sanitary napkins has increased, the menstrual hygienic practices have not changed altogether. It may be due to sense of hesitation to forego traditional methods. Women having better knowledge regarding menstrual hygiene and safe practices are less vulnerable to reproductive tract infections and its consequences. (2) Therefore present study was undertaken to find out the menstrual pattern and menstrual hygienic practices among adolescent girls.

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AIMS AND OBJECTIVES

This study was aimed to assess the menstrual pattern and hygienic practices amongst school going girls.

METHODOLOGY

STUDY DESIGN: Institution based cross sectional study.

STUDY AREA: Urban health centre field practice area of DCMS, Hyderabad.

STUDY SETTING: Private schools.

STUDY PERIOD: July 2015 to Sept 2015.

STUDY POPULATION: All the girls in 9th and 10th standard

INCLUSION CRITERIA: Girls who have attained menarche.

EXCLUSION CRITERIA: Those who have not attained menarche. Those who did not give consent and who were absent on the day of study.

SAMPLE SIZE: Out of the total 190 girls, 6 did not attained menarche, 21 were absent and 13 did not give consent for participation. A sample size of 150 girls was thus obtained.

After obtaining the permission from the school authorities, the girls were explained about the purpose of the study and assured of confidentiality. Consent was obtained from the girls before administering the questionnaire. A pretested questionnaire was administered in English language. Girls were instructed on how to fill the questionnaire and explained about each question in local language. Adequate time was given to fill up the questionnaire. This was followed by a session educating the girls about the normal physiology of menstruation, the importance of maintaining hygiene and safe hygienic practices during menstruation.

DATA ANALYSIS: The responses of participants were entered in MS excel 2007 and analyzed by applying appropriate statistical tests using SPSS package version 16.

RESULTS

Among the 150 study participants, 105 (70%) had attained menarche between 13-15 years of age. About 26 (17.3%) participants gave history of irregular periods. (Table 1)

Table 1: Details of study participants

Age at menarche (In Years)	**Frequency**	**Percentage**
10 - 12	42	28
13 - 15	105	70
>15	3	2
Duration of menstrual cycle		
Monthly once	114	76
Once in 15 days	10	6.7
Irregular	26	17.3

Majority of participants complained of pain in lower abdomen (dysmenorrhea) (50.6%) followed by backache (34.7%). (Table 2)

Table 2: Symptoms during menstruation

Symptoms*	**Frequency**	**Percentage**
Pain in lower abdomen (Dysmenorrhea)	75	50.6
Backache	52	34.7
Breast tenderness	2	1.3
Anxiety	2	1.3
No associated symptoms	19	12.7
Total	**150**	**>100**

* Multiple responses

Among the study participants, 62.7% lacked adequate knowledge regarding menstruation. About 73.3% avoids social gathering and 54.3% were irregular to school during menstruation. 16.7% of the students were not using sanitary pads and 62.7% were disposing it improperly. (Table 3)

Table 3: Knowledge, Attitude & Practice regarding menstruation

Questionnaire	**Yes (%)**	**No (%)**
Knowledge regarding menstruation	56 (37.3%)	94 (62.7%)
Attends social gathering during menstruation	40 (26.7%)	110 (73.3%)
Attends school regularly during menstruation	82 (54.7%)	68 (45.3%)
Sanitary pads usage	125 (83.3%)	25 (16.7%)
Sanitary disposal of pads	56 (37.3%)	94 (62.7%)

* Multiple responses our study 26 % girls were having daily bathing, 64% on alternate days and 10% occasionally during menstruation. (Table 4)

Table 4: Personal hygiene during menstruation

Bathing during menstruation	Frequency	Percentage
Daily	39	26
Alternate day	96	64
Occasionally	15	10
Total	150	100

Majority of participants got the information regarding menstruation from their mothers (74.7%) and 16% from school teachers. (Table 5)

Table 5: Source of information regarding menstruation

Source of information	Number	Percentage
Mother	112	74.7%
School teacher	24	16%
Friends	8	5.3%
Television	6	4%

About 54.6% of participants felt shy watching advertisements regarding sanitary napkins in front of male members and 30% feels they should be banned.(Table 6)

Table 6: Reaction to advertisements regarding sanitary napkins

Reaction to advertisement	frequency	percentage
Feel shy in front of male members	82	54.7
No reaction	19	12.7
Feel embarrassed	4	2.6
Such advertisement should be banned	45	30
Total	**150**	**100**

DISCUSSION

The mean age of menarche was found to be 13 years 9 months (S.D 1.8). The results are almost same as by Chandra Prakash et al[3]. (13.6 years). It was found to be similar to other studies done in different settings (urban-rural). About 62.7% of the participants had poor knowledge regarding menstruation which was similar to study done by Nagar S et al (70%)[4], as it is less frequently discussed at homes or at school. Our study suggested that 74.7 % girls knew about menstruation from their mothers. However it was interesting to note that only 16% girls obtained the information from their teachers. This is similar to study conducted by Abhay et al.[3]

Around 17.3% of participants were having irregular menstrual cycle which was found to be similar to the findings by Vani K et al (17%).[5] The most common menstrual problem was dysmenorrhea 50.6%, followed by back ache 34.7%. In a study conducted by Verma PB et al[6] 50.6% girls had dysmenorrhea during menstruation. In our study 83.3% girls were using sanitary napkins as absorbent material, while 17.7 % were using cloth during their menstrual cycle which is in accordance with Adhikari et al[7] and Shabnam et al[8]. Around 62.7% of participants were disposing it improperly.

About 73.3% avoids social gatherings during menstruation which was higher than the study done by Dinesh Kumar et al (34%).[9] Around 54.4% of absenteeism seen in schools during menstruation which was found to be more than the findings by Bodat S et al (43.2%).[10]

Around 54.7% are feeling shy to see the advertisement regarding sanitary napkin with male persons around. In our study 26 % girls were having daily bathing, 64% on alternate days during menstruation. This was similar to study done by Dasgupta et al[1] & Abhay et al[11]. This shows the low level of personal hygiene in the study participants during menstruation.

CONCLUSION

Our study concludes that considerable adolescent girls had irregular cycles, dysmenorrhea and backache which were the main reasons for absenteeism from school. This will affect their studies. More than half of the participants showed poor personal hygiene during menstruation. Low level of participation in social gathering is also seen during menstruation. The role of teachers as educators regarding menstruation was found to be inadequate. Inspite of increased awareness through mass media substantial number of girls were using cloth during menstruation and disposing the pads improperly.

RECOMMENDATIONS

A considerable prevalence of menstrual irregularity and dysmenorrhoea in this study is affecting the academics of students. It is possible to eliminate menstrual discomfort and improve menstrual hygiene through awareness programmes and proper counseling and management. Girls should be imparted with accurate and complete information well in advance about the menstruation, physiological process involved, its importance in the life of a girl, etc. Teachers need to be made responsible for the teaching of needed information well in advance of the menarche. Unnecessary restrictions, myths and beliefs associated with menstruation can be removed with the help of teachers and parents. Stigma associated with menstruation should be removed by regular counseling.

Conflict of Interest – Nil

Source of Funding- Self

Ethical Clearance – Obtained from Institutional Ethics Committee, DCMS, Hyderabad.

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Study of Immunization Status of Children Less than 5 Years of Age in a Tertiary Health Care Institution of Amritsar - A Hospital based Study

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ABSTRACT

Background: Immunization is an important public health intervention and a cost effective strategy to reduce morbidity and mortality associated with the vaccine preventable diseases.

Aim and objectives:

1. To estimate the immunization status as per the National Immunization Schedule and

2. To identify the socio-demographic profile influencing the immunization status of children under five years of age.

3. **Material and Method:** The study was carried out in the immunization unit of Urban Health Training Center, Department of Community Medicine, Sri Guru Ram Das Institute of Medical Sciences & Research Vallah, Amritsar. It was a cross sectional descriptive study. In the present study, 994 children aged 0-5 years were included. The study involved interviewing the mother/caregiver having a child in the age group of 0-5 years, using a Performa to obtain characteristics of mothers and immunization history of children. It was carried out from November 2016 to January 2017. Statistical analysis was done and valid conclusions were drawn.

4. **Results**: Majority of mothers (95.77%) were literate. Majority of the children (93.96%) were completely immunized. Sex of a child had no significant association with immunization coverage.

Discussion: Present study showed that most of the children under study were completely immunized as per the National Immunization Schedule. The study had shown that there was a direct positive correlation of the higher socio-economic and literacy status of mothers/caregivers with the immunization coverage of children. Immunization coverage is found more in children delivered in hospitals/Govt. Institutes as compared to children delivered in homes.

Keywords: *immunization, prevalence, Chi square, immunization, socio-demographic factors.*

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INTRODUCTION

In developing countries like India where the vaccine preventable diseases prevalence 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 children

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. Immunization forms the major focus of child survival programmes throughout the world. Over Two million deaths have been delayed through immunization and approximately three million children die each year worldwide due to the vaccine preventable diseases. Recent estimates suggest that approximately 34 million children are not completely immunized, with almost 98% of them residing in the developing countries. Though there is increased accessibility of health care services in both urban and rural areas, still the utilization of health care services is low by the different segments of the society[1]. The current scenario depicts that immunization coverage has been steadily increasing but the average level remains far less than the desired. Still only 44 per cent of the infants in India are fully immunized (NFHS-III) which is much less than the desired goal of achieving 85 per cent coverage[2].Therefore immunization is one of the most cost effective and highest-impact public health intervention, reducing hospitalization and treatment costs through prevention, which directly or indirectly prevents the bulk of mortality associated with Vaccine preventable Diseases in children under five years of age in India. 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[3]. Hence the present study was undertaken with aim

(I)To estimate the immunization status of children and

(ii)To identify the socio-demographic factors influencing the immunization status of children from 0-5 years of age. As coverage data are traditionally considered as the best indicators of an immunization program's performance because these data reflect the management of, access to, and utilization of services.

MATERIALS AND METHOD

The study was a cross sectional descriptive study that involved interviewing the mothers/primary care takers 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 (UHTC) 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 inspection for 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 as per universal immunization program, Partially immunized: Child who had not been completely immunized but received only one or two doses of vaccine for his/her age as per 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).Statistical analysis of data in the form of comparison of immunized and un-immunized status of the child to age, sex and education of mother was done with percentages and chi square test. P value <0.05 was considered as significant. Analysis of association between immunization coverage and various socio-demographic variables was done using chi square.

Inclusion criteria

Children under five years of age attending Urban Training Health Centre of S G R D Institute of Medical Sciences and Research, Amritsar.

Exclusion criteria children, who were seriously ill, too agitated & unwilling for immunization, were excluded from the study.

RESULTS/OBSERVATION

Table 1: Distribution of children according to the age group& sex (n =.994)

Age in months	Number	Frequency
-12 months 13-24 months 25-36 months 37- 48 months 49 -60 months Total	169 178 234 226 187 994	17% 17.91% 23.54% 22.73% 18.81% 100%
Male	573	57.65%
Female	421	42.35%
Total	994	100%

In the present study, a total of 994 children under five year of age were included. Out of these, 573 (57.65%) were male and 421 (42.35 %) were female children. There were 169 (17%) children in the age group of 0-12 months, 178 (17.91%) in the age group of 13-24 months, 234 (23.54%) in the age group of 25-36 months, 226 (22.73%) in the age group of 37-48 months and 187 (18.81%) were in the age group of 49 -60 months.

Table 2. Showing various socio-demographic factors of the study population (n=994)

Variable		Number	Frequency (%age)
Religion	Hindu Sikh Muslims Christians Others	380 544 28 22 20	38.23 54.73 2.82 2.21 2.01
Resident status	1. Resident 2. Migrant	795 199	79.98 20.0
Literacy status of Mother	1. Illiterate 2. Primary 3. Secondary literate 3. Above Secondary	42 58 952 368 526	4.23% 5.83 37.02 95.77% 52.90
Occupation of the mother/father	i. Skilled ii. Skilled iii. Unskilled iv. v. Professional vi. Lab our /Daily Wages vii. Private /Govt job	394 248 48 106 198	39.64 24.95 4.83 10.70 19.91
Type of the family	1. Nuclear Family 2. Joint Family	132 862	13.28% 86.72%
*S-E status of the Family * On the basis Of Modified B.G Prasad Classification July 2014.	* 1. Class-I 2. Class-11 3. Class-Iii 4. Class-Iv 5. Class-V	328 373 158 79 56	33% 37.52% 15.90% 07.95% 05.63%
Immunization card	1. Present 2. Not present	880 (88.53%) 114 (11.47%)	

888.53On the basis Of Modified B.G Prasad Classification July 2014.

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. Gender-wise vaccination status among study subjects (n=994)

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

Chi-square=0.796 df=4 p=0.939 (not significant)

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 (cye=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. Distribution of children according to their vaccination status in relation to various socio-demographic factors.

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-> 49	608	93.97	29	4.49	10	1.55

Chi-square =0.796 df=4 p=0.939 (not significant).

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 25-49 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 1 328	319	97.26	4	1.22	0	-
Class11 373	366	98.12	6	1.61	0	-
Class 111 158	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
Chi–square =134.299; df=8; p=0.000 (highly significant)						
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
	Chi–square =84.014; df=2; p=0.000 (highly significant)					
Family Type Joint	862	86.72	6	0.7	2	0.23
Nuclear	132	13.28	7	5.30	5	3.37
	Chi–square =36.28; df=2; p=0.000 (highly significant)					
Immunization cards (n=994)	Fully vaccinated	%age	Partially vaccinated	%age	Un-vaccinated	%age
Present 816	809	99.14	05	0.61	02	0.24
Absent 178	163	91.57	12	6.74	03	1.69
Total 994	972		17		5	
Chi–square =38.96; df=2; p=0.000 (highly significant)						

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%) Statistically this finding was highly significant (p=0.000) it 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 for routine vaccines as compared to those who did not had the immunization cards.which was a significant finding (p=0.000)

Table 6. Distribution of newborns according to their place of birth place of Birth and at birth vaccination relationship.

Place of delivery	No	B CG/OPV/Hepatitis B given	BCG 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%)
Chi-square =868.479; df=1,;p=0.000 (highly significant)			

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 BCG at birth and, zero doses of OPV and Hepatitis B vaccines before they were discharged from the hospital as compared to those born at homes (03.71%).This observation has found to be statistically highly significant (p=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, Kaur H, Kaur A, Kaur H, Jhajj K in Amritsar[4] but in contrast o the cross sectional study conducted by Saxsena P et al who found that only 30% of the children were completely immunized[5].This might be due to better knowledge,socio-economic status, literacy rate 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 Maharashtra[6].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.(P=000 highly significant). Similar finding showing a positive correlation between maternal education status and complete immunization status of child was reported by Mathwes in a review study[10]. Children born in the joint families were more likely to be vaccinated as compared to nuclear families. which might provided 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 of the children were the place of birth. Children born at home were less likely to receive BCG and zero doses of OPV and Hepatitis B (03.71%) as compared o those born in hospital (97.42%). These findings were in consistent with the studies of Coetzee N, Berry DJ, Jacobs ME in Mozambique and South Africa have also observed the same [7-8]. Mothers who deliver at home may be non-users of health services in general and have to be targeted for utilization of health services.

CONCLUSION

Mother’s education significantly influences the immunization coverage among the under-fives. Sex of a child had no significant association with immunization coverage

Recommendations : Institutional deliveries should be promoted so that each and every child should be vaccinated at birth place before they are discharged.

Education programmes that can target poor and uneducated parents/mother should be put In place so that they are able to make informed decisions regarding Immunization of their children.

Contributory Statement

All the authors were involved in data collection and patient management. All the authors have read and approved the final manuscript.

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Conflict of Interest: None

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Midline Diastema Closure by Interdisciplinary Approach-A Case Report

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ABSTRACT

Midline diastema closure is an esthtic and technical challenge for clinicians. Various materials are available for diastema closure. Case should be should be carefully analysed with proper history for for etilogical factors and best possible treatment plan. High frenal attachmentProper communication with patients for their choice regarding various treatment options in detail should be done, before moving forward with any treatment plan. Even though it seems to be a simple procedure, restoring the teeth to close the diastema without gingival inflammation, without creating any ledges or overhangs which irritates the periodontal structures and presence of "black triangles", is quite difficult. This article summarizes the technique of closure of diastema using direct resin composite with interdisciplinary approach.

Keywords: *Midline diastema, Papilla penetrating frenal attachment , frenectomy, veneer,interdisciplinary approach*

INTRODUCTION

Tooth size discrepancy or inappropriate distribution of space in the anterior region of mouth is a major esthetic problem for patients.[1]Midline diastema is one of the esthetic problems which challenges the clinician. Anterior midline spacing between anterior teeth is called midline diastema. Various materials such as ceramics, composite resin and ceramic fused to metal (PFM) are available with direct and indirect techniques are available to have the space closed without any adverse effect on the periodontium. Techniques such as direct resin placement using Mylar strip, putty index method, crown forms as matrix can be used for direct placement of composite resin. Among the indirect methods veneers, crowns made up of ceramic or PFM crowns.

Etiological factors for midline diastema.[2]

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Physical impediment:

1. Retained decidous teeth
2. Mesiodens
3. Abnormal frenum
4. Deep bite
5. Microdontia

Habits

1. Thumb sucking
2. Frenum thrusting
3. Artificial causes:-
4. Rapid maxillary expansion.
5. Milwauke braces.

Treatment planning has to be depending on the cause. It can be

- Habit breaking appliance with orthodontic movement of teeth
- Extraction of mesiodens with orthodontic movement of teeth
- Frenectomy with restoration
- Moving teeth closer with orthodontic movement of teeth

- Restorations such as veneers and crowns

This case report describes the interdisciplinary approach used for closing a diastema periodontal and direct restorative approach .

CASE REPORT

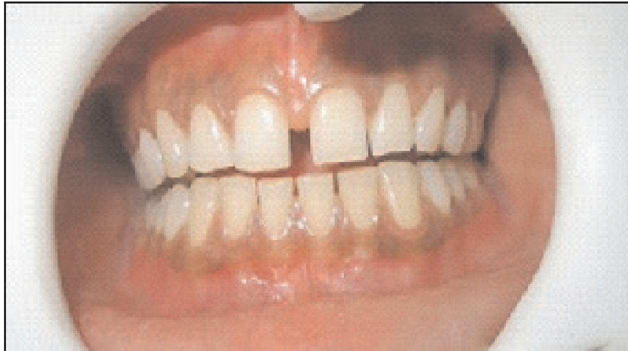

Fig. 1: Pre operative phograph showing midline diastema

A 21-year-old female reported to the department with chief complaint of not happy with her smile because of spacing between her upper teeth.(Fig.1)No relevant history was reported. Medical & family history were non-contributory. Past dental history revealed patient had undergone orthodontic treatment for the space between two upper central incisors, but there was relapse in the treatment.Personal history was not significant

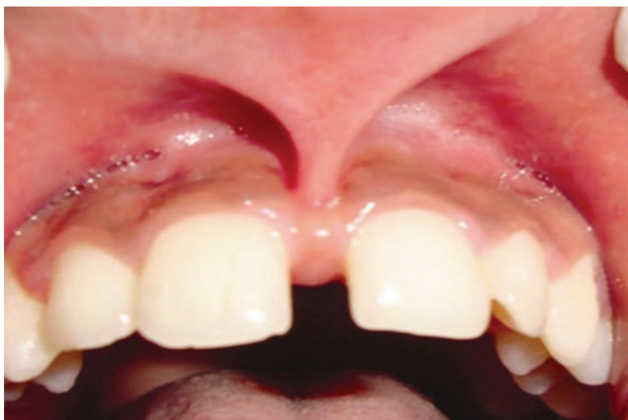

Fig. 2: Papilla penetrating – When the frenal fibres cross the alveolar process and extend up to palatine papilla

No abnormalities were detected on extraoral examination. Intraoral examination revealed midline diastema. There was a high frenal attachment of papilla penetrating type in between the maxillary two central incisors.(Fig.2) Preoperative evaluation done with intraoral radiographs and pulp sensibility tests were done. Teeth were confirmed to be vital. Pre-operative photographs were taken for recording and documentation. Treatment planning was done and discussed with patient. Patient wanted economical and faster treatment. Since diastema closure with resin composites,creates wider image of incisors, crown lengthening was planned to maintain height and width ratio of the crown. Hence frenectomy of upper labial frenum with direct composite restoration for two central incisors was planned along with crown lengthening. Treatment was initiated with the informed consent of the patient.

Steps involved with treatment were:

- Thorough oral prophylaxis
- Impressions were made of both the arches and cast was prepared(Fig 3)
- On the cast frenectomy and crown lengthening were planned by creating templates.
- Local anesthetic was administered using 2% Lignocaine with dilution of 1:200,000 epinephrine
- Surgical template was used for crown lengthening
- Frenectomy and crown lengthening were performed simultaneously
- Crown lengthening was done by marking the depth not to violate biologic width and using template (fig 4)
- A narrow elliptic incision is put around the frenal area deep up to the periosteum .
- Since it was a papilla penetrating frenum, it was dissected with BP blade from the underlying periosteum and soft tissue, and the margins of the incision are gently undermined and re-approximated and sutured. Recalled after a week for evaluation of healing(Fig 5).
- One week later mock up of the restoration was done on the cast with wax.
- Template was prepared using putty-index technique using putty of additional silicone
- The appropriate shade of direct composite is selected.
- Isolation was done using rubber dam
- Shades selected from Filtek Supreme Ultra, 3M ESPE [St. Paul, MN] composite resin; for restoration
- Incremental build up was done using body, dentin and enamel shade of A3. Light-cured the direct resin buildup.
- Finishing and Polishing using Shofu composite finishing kit and Sof-Lex disks (3MESPE)
- Proximal polishing was achieved by sequentially

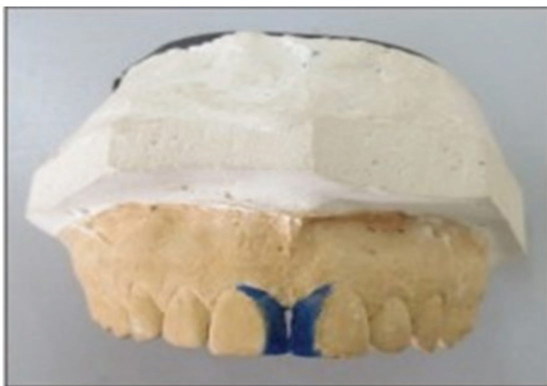

Fig 3:Alginate impression of upper arch was taken and cast was poured for wax mock up

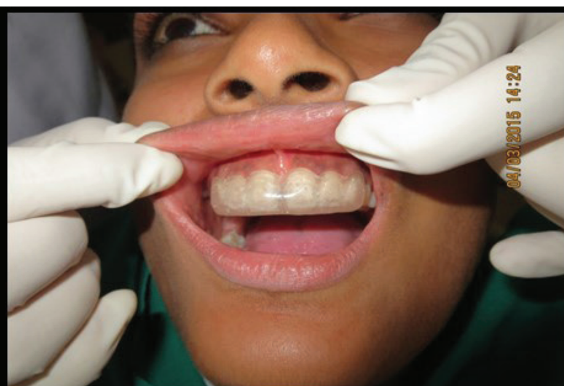

Fig 4:Surgical template was used for crown lengthening

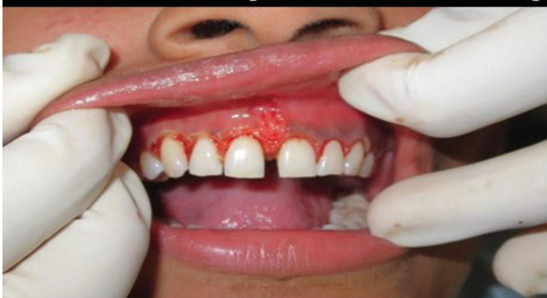

Fig 5:Post surgical view: Frenectomy and crown lengthening performed simultaneously

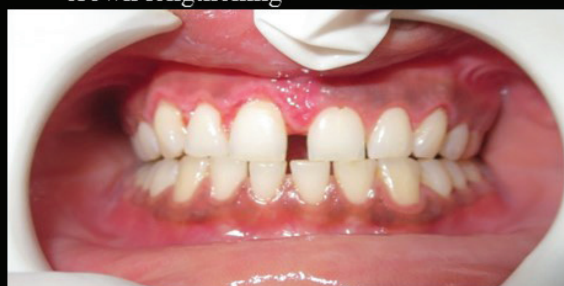

Fig 6: One week after the surgery showing good healing of surgical site

using interproximal polishing strips (Epitex strips, GC America; Alsip, IL). (Fig 6)

- Patient was recalled after a week to evaluate satisfaction, gingival healing, and marginal adaptation.

DISCUSSION

The esthetic appearance of teeth forms a part of an overall picture, interacting closely with facial esthetics. Since a pleasant smile is governed largely by symmetry, asymmetry at the midline creates an unacceptable esthetic presentation for both patients and observers.[3] Present treatment modality was selected for easier, faster, less expensive mode of therapy with esthetically good result. There are few aspects had to be considered while planning the treatment.

- Crowns height and width ratio of the crown.
- Black triangle between the two central incisors
- Post treatment gingival health
- Esthetics with resin composites

According to Kulik BL *et al* [4] direct resin bonding along with orthodontic movement of teeth allows space closure and midline diastema correction creating better esthetic results. In present case, other treatment options available were orthodontic therapy to close the diastema which was ruled out because of relapse and patient wanted faster treatment and also did not agree to undergo longer orthodontic therapy

Ceramic crowns were expensive modality of treatment which patient rejected. Hence the present modality was chosen. Height and width ratio of crown had to be maintained to 1;1.6. Hence crown lengthening was planned. Surgical template optimizes the precision of gingival zenith without disturbing the biological width during crown lengthening. Hence putty index following wax mock up helped to create exact gingival contour biologically and esthetically. According to Kim YH *et al* diastema closure with bonded restoration and gingival contouring provided best esthetic results.[5] Patient had papilla penetrating frenum where frenal fibres cross the alveolar process and extend up to palatine papilla. Hence frenectomy was planned not only for improving esthetics but also because of the firm frenum which would detach the composite resin restoration bonding to the enamel, while retracting the upper lip. Nanofilled composite

resin chosen has adequately good property, esthetically good because of high polishability, wear resistance is good hence more durable. Moreover. Tooth preparation is minimal and conservative. According to Lenhard et al, amongst the suggested options for diastema closure such as orthodontic, restorative and prosthodontic treatment, the use of proximally applied resin composite seems to be more practical and conservative.[6] Hence this technique and material were chosen.

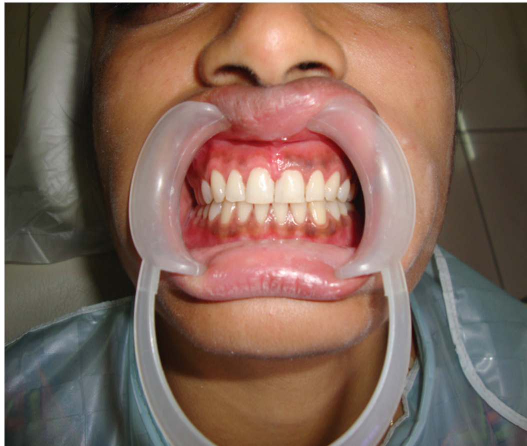

Fig 7: Post restoration photograph showing diastema closure

Ethical Clearance- Taken from Institutional Ethical committee, MCODS, Mangalore.

Source of Funding- Self

Conflict of Interest - Nil

CONCLUSION

Tooth size discrepancy or inappropriate distribution of space in the anterior region of mouth is a major esthetic problem for patients. One of the biggest challenges for clinicians is to satisfy the needs of patients who seek esthetic treatment because of shape and shade of the final restoration, presence of "black triangles" around the teeth when closing anterior diastema. However, this can be managedeffectively by proper treatment planning.

The success of a restorative treatment in anterior teeth depends on the integration of estheticsof soft and hard tissues, direct and faster restorative techniques for an optimal result, using interdisciplinary approach.

The direct composite resin restorations can be placed in a single visit, often do not require preliminary models or wax-ups, and do not involve laboratory fees that escalate costs. In terms of aesthetic dentistry, these restorations offer numerous advantages that other possible treatment options such as ceramic veneers and orthodontic treatment do not have. They are kinder to the opposing dentition compared to ceramic materials.

In this case midline diastema was closed by composite resin, adjuncted by frenectomy and crown lengthening procedures for esthetic and functional corrections.

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Changing Health Status and Service Needs: Health Care System in Kerala

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ABSTRACT

Background: Health is an important aspect of a society, which needs proper care through governmental and non-governmental interventions.

Objectives: The paper tried to examine the determinants of health status and health care services in Kerala State.

Method: This empirical study is categorised as explanatory and comparative analysis based on national and state level secondary data.

Findings: Some of the health indicators like birth rate and child mortality rate in Kerala showing an unfavourable trend, and in many cases, they are getting lower than the national average. The morbidity rate, especially due to non-communicable diseases is high in Kerala when compared to national level. Malnutrition and under nutrition started rising, which shows that 32.7 percent of women aged between 15-49 years old with anemia, 13 percent children under 3 years who have low birth weight (<2.5 kg), 48.5 percent of children between 6-59 months old with anemia, 34.8 percent adolescent girls 15-18 years old with low BMI (<18.5).

***Keywords** – Health status, Communicable/Non communicable diseases, Morbidity, Provision of health care, Nutrition*

INTRODUCTION

The structured provision of services like prevention, curing of illness, and protection of mental and physical well-being may constitute a health care system. The health system also responds to the demand, created by people. Demand for health services in turn creates the main health sector market through high morbidity that concerns chronic and newer diseases due to changing age structure, life style diseases and environment pollution.

Kerala State one of the southernmost part of India, made remarkable achievements with respect to mortality and fertility but the level of morbidity was reported to be high and resulted in occurrence of a debate on the 'low mortality and high morbidity syndrome' in Kerala[1]. This debate concentrated on whether higher level of morbidity in Kerala existed because of higher level of literacy, better healthcare infrastructure and higher utilization of health care services. State intervention to provide health care facilities has also been significant in the spread of Allopathic, Homeopathic and Ayurvedic systems of medicine. Higher literacy coupled with better availability and accessibility of health care infrastructure helped the state in attaining a better position in health care utilization as compared to other States in India. The paper made an attempt to evaluate the health indicators, morbidity status, nutritional status and provision of health care services in India and Kerala.

MATERIALS AND METHOD

This empirical study is categorised as explanatory and comparative analysis based on national and state level secondary data. The assessment of health indicators are based on Census 2001 and 2011. National Health Profile is an annual publication of the Central Bureau of Health Intelligence, a national nodal institution for health

intelligence in India, which provides a broad overview on the incidence and prevalence of Communicable and Non-communicable diseases. NFHS(National Family Health Survey) Series of surveys published by Ministry of Health and Family Welfare (MoH&FW), Government of India provides trend data on key indicators of nutritional status at the state level.

FINDINGS

Life expectancy has increased both in India and in Kerala. In India, it has increased from 65 years (2001) to 66.1 years (2011) and in Kerala from 73.4 years (2001) to 74.2 years (2011). As shown in the below fig.1, the death rate has shown a decrease in India from 8.4 in 2001 to 7.1 in 2011 but in Kerala, it has shown an increase from 6.6 to 7. The fig.1 shows that the health indicators in India have shown significant improvements from 2001 to 2011. While in the case of Kerala, some of the health indicators show unfavourable trend like birth rate decreases from 17.5 (2001) to 15.2(2011), infant mortality rate and death rate increases from 11(2001) to 12 (2011) and 6.6(2001) to 7(2011) respectively [2].

Kerala ranks first among the Indian states with respect to the sex ratio indicators. The sex ratio of total population reveals that there is 26 point increase from 2001 (1058) to 2011 (1084). There was a sharp decline in child sex ratio of this age group from 927 in 2001 to 919 in 2011[2]. One of the main reasons for this could be the emergence of modern medical technology, mainly ultra sound scanners which helped in identifying the sex of the fetus and thus giving a chance for the parents to decide whether to or not to proceed with the pregnancy. Census 2011 also reported that, “The phenomenon has reached high proportions in states which had no prior history or practice of female infanticide, or where forms of discrimination against girls were not strongly evident earlier” [3]. This situation was not much different in Kerala because sex ratio for the children aged 0-6 years is 959.

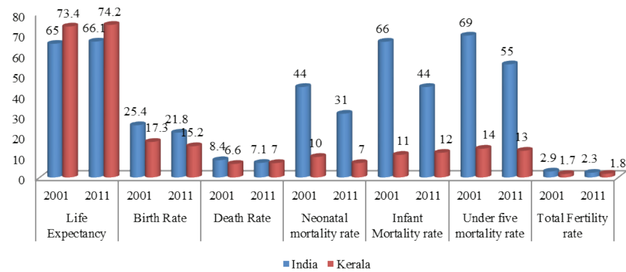

Figure 1: Health Indicators of India and Kerala

Source: Census 2001 and 2011

Higher level of morbidity: Morbidity indicators are incidence or prevalence of diseases, which counts communicable diseases and non-communicable diseases. When comparing disease prevalence rate of major diseases in India, Acute Respiratory Infections is highest (2.74). Out of fifteen major Indian states, Kerala (10.86) stands first in the disease prevalence rate of Acute Respiratory Infections which is five points higher than the national average followed by Uttar Pradesh, Odisha, West Bengal, Andra Pradesh and lowest is Assam (0.18). It is also same in the case of disease prevalence rate of chicken pox (.0026) and non-communicable diseases such as cancer/diabetes/CVDs (3.28) which are three fold greater than that of the national average. Kerala, Uttar Pradesh, Maharashtra, Haryana, and Gujarat are the states having higher levels of disease prevalence rate of non-communicable diseases than the national rate [4] (TABLE1).

TABLE 1: Communicable and Non-Communicable Diseases during 2014-2015

States	Acute Respiratory Infections	Measles	Viral Hepatitis	Laprosy	Chicken pox	Cancer/Diabetes /Cardio vascular&stroke
AndraPradesh	4.01	0.000	0.015	0.55	0.000	0.05
Assam	0.18	0.001	0.001	0.28	0.000	0.16
Bihar	2.94	0.008	0.013	1.09	0.001	0.03
Gujarat	1.59	0.001	0.005	1.15	0.002	0.98
Haryana	3.45	0.000	0.004	0.26	0.001	0.84
Karnataka	3.57	0.002	0.009	0.44	0.001	0.40
Kerala	**10.86**	**0.002**	**0.012**	**0.22**	**0.026**	**3.28**

***Cont...* TABLE 1: Communicable and Non-Communicable Diseases during 2014-2015**

Madhya Pradesh	2.49	0.001	0.023	0.77	0.001	0.23
Maharashtra	1.11	0.002	0.006	0.91	0.004	1.10
Odisha	5.36	0.001	0.010	1.24	0.002	0.16
Punjab	1.99	0.000	0.010	0.20	0.000	0.37
Rajasthan	2.53	0.000	0.002	0.18	0.001	0.19
Tamil Nadu	2.36	0.001	0.002	0.40	0.004	0.00
Uttar Pradesh	9.14	0.002	0.051	0.81	0.001	2.01
West Bengal	4.46	0.006	0.008	0.87	0.002	0.16
Total	**2.74**	**0.002**	**0.009**	**0.75**	**0.003**	**0.46**

Source: Computed from National Health profile 2015[4]

Cardio Vascular Diseases, Cancer, Diabetes, Chronic Obstructive Lung Disease, Mental disorders and injuries are the main causes of death and high rate of morbidity due to Non- Communicable diseases (NCDs) in Kerala. A community-based study in Kerala [5] found that there exist significantly unhealthy life style practices among Keralites such as smoking (42%), low level of physical activity (7%), a diet low in fruits and vegetables (40%), other behavioural habits etc which constitute 60-70 per cent. It is estimated that 35,000 new cancer cases have reported in Kerala within one year. Among males 50% of cancers are in the mouth, throat and lungs, which are caused by the consumption of Tobacco and alcohol. Among women tobacco related cancers are 15% [6]. Among the NCDs the prevalence of Cardiovascular Diseases (3.29) is highest[7]. Kerala is the diabetes capital of India with a prevalence of diabetes as high as 20%, double the national average of 8% [8]. Diabetes Mellitus is a main risk factor for many other major diseases. Lungs Diseases, Neurological Disorders & Psychiatric Disorder and Injuries & Road Accidents are other major NCDs in Kerala, which comprises 0.15, 0.22, and 0.87 respectively [9].

Nutritional status**:** According to Rapid Survey of Children (2013-2014)[10], 38.7 percent of Indian children under the age of five are stunted, 19.8 percent are wasted and 42.5 percent are underweight. Nationwide data among stunting, wasting and underweight among under three children in NFHS Series revealed that, India's average annual rate of under-five stunting decline between 2006 and 2014 has been 2.3 percent per year, compared with a rate of decline of 1.2 percent per year between 1992 and 2006(11). Kerala shows poor nutritional status when compared to national level progress (TABLE 2). The data revealed that stunting rates under three children declined by 6.3 percentage points, while wasting increased 2 percentage points and the underweight by only 0.9 percentage point decrease from NFHS-I to NFHS-III. Anemia is another important index of diet related problems. According to India Health Report on Nutrition (2015), in Kerala, anaemic women aged between 15-49 years old were 32.7 percent; children under 3 who have low birth weight (<2.5 kg) were 13 percent; anaemic children between 6-59 months old were 48.5 percent; adolescent girls (15-18 years old) with low BMI (<18.5) were 34.8 percent; and the 'state' does not have a high level nutrition mission [12].

TABLE 2: Nutritional Status in Kerala

% Children under 3 who are	NFHS-I 1992-1993	NFHS-II 1998-1999	NFHS-III 2005-2006
Stunted	32.8	28.0	26.5
Wasted	13.7	13.0	15.6
Underweight	22.1	21.7	21.2

Source: NFHS III [11]

Health care services: Gradually, the public sector is unable to meet the demands for health care which has led to the impetus growth of the private medical care set up in the Kerala State and the dependence on private health care is quite high even among the lower expenditure classes and rural areas [13].

TABLE 3 shows the state wise number of rural and urban government hospitals per '000 sq. km. In rural areas, it is highest in Kerala (32 hospitals in '000sq.km)

among the Indian States and is six times higher than that of all India level (5.4). Urban Kerala has 44 hospitals which rank the ninth position when compared to other states. The total number of government hospitals in '000sq.km shows that at all India level there were 6.2 hospitals per '000sq.km, it is highest in Kerala figured nearly 33, which is around five times higher than the national level (TABLE 3). This reveals that the number of hospitals in Kerala based on the land area indicates that relatively better geographical accessibility to health care facilities in Kerala especially in rural areas. With regard to the number of beds per/lakh rural population, it is highest in Kerala (103/100000) and lowest in Bihar (6/100000). The number of beds per/lakh population in rural areas of Kerala is five times more than the national level (TABLE 3).

TABLE 3: Number of Rural and Urban Government Hospitals per 1000 sq.km 2015

States	Rural			Urban			Total		
	Hospitals	Govt Hospitals in '000sq.km	No: of beds per/lakh population	Hospitals	Govt.Hospitals in '000sq.km	No: of Bed per/lakh population	Govt. Hospitals	Govt Hospitals in '000sq.km	No: of beds per/lakh population
Andhra Pradesh	222	1.4	21	56	13.6	85	278	1.7	40
Assam	1088	14.0	28	49	50.9	134	1137	14.5	43
Bihar	1325	14.3	6	111	61.5	54	1436	15.3	11
Gujarat	296	1.6	26	89	17.0	74	385	2.0	46
Haryana	80	1.9	15	79	61.7	59	159	3.6	30
Karnataka	439	2.4	26	215	41.6	183	654	3.4	87
Kerala	1135	31.9	103	143	44.0	128	1278	32.9	115
Madhya Pradesh	334	1.1	19	117	16.8	91	451	1.5	39
Maharashtra	450	1.5	20	135	18.4	298	585	1.9	146
Odisha	1659	10.8	20	91	32.6	137	1750	11.2	40
Punjab	94	1.9	17	146	70.2	86	240	4.8	43
Rajasthan	2656	7.9	64	489	90.0	80	3145	9.2	68
TamilNadu	407	3.5	25	381	30.4	158	788	6.1	89
Uttar Pradesh	737	3.1	-	94	14.3	-	831	3.4	-
WestBengal	1272	14.9	32	294	88.4	202	1566	17.6	86
India	16816	5.4	22	3490	44.7	131	20306	6.2	56

Source: Computed from National Health Profile, India Health Statistics 2015

Health Expenditure: According to the National Health Accounts [14] from 2012 to 2016(BE) health expenditure to total expenditure shows a decreasing trend in most of the states in India. In 2015-2016, (BE) Kerala's public health expenditure to total expenditure is only 4.45%, which is lower than the major states like Gujarat(6.19%), Maharashtra(7.96%), Rajasthan(9.49%), Tamil Nadu(6.44%), and West Bengal(5%). TABLE 4 indicates that, the monthly per capita household out of pocket medical expenditure at the national level is Rs.95 in rural areas and Rs.146 in urban areas. It varies from state to state and it is highest both in rural (Rs.244) and urban areas (Rs.275) of Kerala State. According to 'NSS-71st round survey on Social Consumption:Health 2015'[15] in India, average total health expenditure including stay at hospital and other expenditure on account of hospitalization per family is Rs.16956 in rural areas and Rs.26455 in urban areas.

The state wise analysis shows that except Kerala State, the average total medical expenditure is low in rural areas and high in urban areas.

TABLE 4:Average expenditure and non-medical expenditure on account of hospitalization per hospitalization case (in Rs.)

States	*Monthly Percapita medicalexpenditure		#% medical expenditure during stay at hospital		#% of other expenditure on account of hospitalisation		#Total Medical Expenditure	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
AndraPradesh	125	144	85.8	92.8	14.2	7.2	15411	33671
Assam	29	116	81.8	89.9	18.2	10.1	8520	52368
Bihar	52	78	83.9	89.1	16.1	10.9	13626	28058
Gujarat	82	120	91.7	94.7	8.7	5.3	15600	21276
Haryana	113	149	87.6	91.9	12.4	8.1	20945	35217
Karnataka	123	137	87.4	91.7	12.6	8.3	16118	24202
Kerala	244	275	91.0	90.3	9.0	9.7	**19385**	**17117**
MadhyaPradesh	66	125	85.4	91.0	14.6	9.0	15326	26374
Maharastra	-	-	91.1	95.1	7.8	4.9	22486	31028
Odisha	67	89	81.2	87.0	18.8	13.0	12616	22713
Punjab	196	197	93.1	93.7	6.9	6.3	29779	31978
Rajasthan	92	92	82.4	91.2	17.7	8.8	15609	18346
TamilNadu	99	149	84.8	91.1	15.2	9.0	13968	26092
Uttar Pradesh	106	127	90.8	94.8	9.2	5.2	20594	33402
WestBengal	91	193	88.2	91.3	11.8	8.7	12841	27249
India	95	146	88.1	92.4	11.9	7.6	16956	26455

*Source: Computed from #NSSO-71st Round, 2015*CBHI-National Health Profile (2015)*

After 1960's percentage share of health care expenditure to total expenditure in Kerala's health care budgets have undergone substantial change. For instance, pays and allowances have increased from 36.6 percent in 1960 to 62.8 percent in 1995. There were sharp decline in the share of the state health expenditure and the proportion allocated to drugs and medicine which was as high as 39 percent in 1960 which declined sharply to 18 percent in 1995[16]. The decentralization policy brought no significant change to the health sector both quantitatively and qualitatively and it does not ensure empowerment[17].The insufficient budget allocation for the supply of medicines and drugs is the fundamental problem in the health care delivery system in Kerala. Neo-liberal policies adversely affected the health sector of Kerala. The share of health expenditure to the total development expenditure in Kerala shows decreasing trend from 13.09 (2000-01) to 12.48 (2004-05): and stagnating pattern of 11.51 (2010-11) and 11.33 (2016-17 BE) [18].

CONCLUSION

Kerala Health Model which was known in the past as the distributor of a high degree of equity with quality is now marked by wide spread inequalities. While the state becomes better in providing more number of health care services but the morbidity rate also shows higher level especially in non-communicable diseases. This could be due to the increasing health awareness among Keralites who may undergo regular checkups and update their health status. But in reality this health awareness and hence reporting themselves as morbid could not

be considered as the single reason for having largest number of morbid people than that of other states. The changing lifestyle of the people in terms of increasing consumption of fast/junk food, lack of exercise etc are the real factors for boosting the number of morbid(s) in Kerala. The State should also execute the Nutritional Policy-to add food safety as one of the essential matter of public health and health awareness which will provide from the primary producer to the consumer.

Ethical Clearance : Not Applicable

Sources of Funding: None

Conflicts of Interest: None

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Congenital Disorders in India – Where are We?

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ABSTRACT

Tackling the rising birth defects in India demands an in-depth knowledge on inadequacies in health policies and health care provision in India. This review provides an understanding on the status of congenital disorders in India; the incidence and prevalence rates, contributing factors, fallacies in existing genetic services and impediments limiting community genetic services in India. The literature review for this article included a systemic search of scientific publications using Pub Med, Google Scholar, and Web of Knowledge by using the following keywords: "Genetic disorders," "Congenital anomalies," "Birth defects" and "Genetic services". This was combined with a manual review of published articles and abstracts from national and international meetings, discussions and conferences.

Keywords: *Congenital anomalies, Genetic disorders, Community genetic services*

INTRODUCTION

Congenital disorders include all structural and functional abnormalities (including metabolic disorders) occurring during intrauterine life which can be recognized prenatally, during birth or later in life[1,2]. About 94% of 7.9 million global births with congenital disorders occur in the middle and low income countries[2]. Though intensified efforts towards control of infections and nutritional deficiency diseases in infants have decreased infant mortality rates in India[3,4], concurrently, it has resulted in congenital disorders being identified as prime cause for perinatal/infant mortality in India[5,6,7]. Accounting for 8-15% of perinatal deaths and 13-16% of neonatal deaths in India[7,8], congenital disorders contributes significantly to preterm births, fetal loss, childhood and adult morbidity and negatively impacts lives of individuals and health systems[2,7,9,10].

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INCIDENCE AND PREVALENCE

With birth rate of 20.88/thousand population in 2014[11], India has the highest number of infants born with birth defects in the world[12,13]. Overtaking immaturity as a cause for perinatal mortality, congenital malformations are attributed as the second commonest cause of mortality among stillbirths, third most common cause of perinatal mortality, and the fourth commonest cause of neonatal mortality in India[12-17]. Currently, prevalence of birth defects in India varies from 61-69.9/1000 live births (6-7%) translating to about 1.7 million births with congenital defects occurring annually in the country[2, 18].

Congenital heart defects (8-10/1000 live births), congenital deafness (5.6-10/1000 live births), Neural tube defects (4-11.4/1000 live births), Down syndrome (1.4/1000 live births) and Hemoglobinopathies are the commonly occurring congenital disorders[19-24]. Among them Beta-Thalassaemia (5% off the population are carriers), Cystic Fibrosis, Sickle Cell Anemia, Spinal Muscular Atrophy and Hemophilia A are the five most common genetic disorders in Indian ethnicity[25]. Table 1 and 2 presents the incidence and prevalence rates

Table 1: Estimated incidence of congenital disorders in India

Disorder	Incidence	Births/year
Congenital malformations	1: 50	678,000
Down syndrome	1: 800	34,000
Metabolic disorders	1:1200	22,477
β thalassemia and sickle-cell disease	1: 2700	16,700
Congenital hypothyroidism	1: 2477	10,900
Duchenne muscular dystrophy	1:5000 (M)	2,700
Spinal muscular atrophy	1:10,000	2,700

Source: Birth Defects in South-east Asia a Public Health Challenge – Situational analysis (2013)

Table 2: Estimated prevalence of congenital disorders in India

Children born with birth defects annually	1722404	
2009 annual births (000s)	26 787	Per 1000 live births
Birth defects of the cardiovascular system	7.9	
Neural tube defects	4.7	
Haemoglobin syndromes	1.2	
Down syndrome	1.6	
G6PD deficiency	2.4	
Total of birth prevalence with no known preventive strategies in place	64.3	

Source: Birth Defects in South-east Asia a Public Health Challenge – Situational analysis (2013)

A greater incidence of congenital disorders in India is seen in male babies, in preterm and low birth weight babies, in multipara, in consanguineous marriages, in older mothers and in caesarian deliveries[5,9,24-30]. Central nervous system, musculoskeletal system, gastro-intestinal tract, genitourinary, cardiovascular system and skin are the commonly affected systems[12,30,31].

Contributing factors to high prevalence of congenital disorders

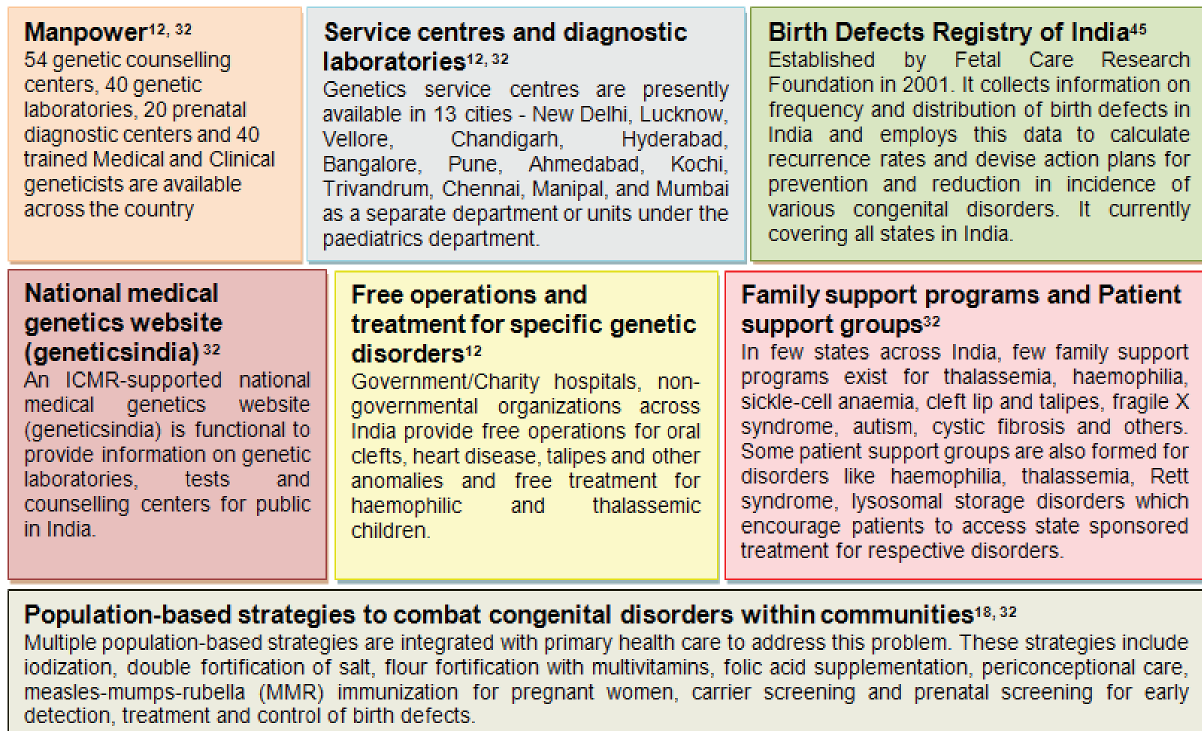
Multiple factors contribute to high prevalence and incidence of congenital disorder in India and these are described in Figure 1

Figure 1: Contributing factors for high prevalence of congenital disorders in India[11,12,16,18,32-40]

Genetic services in India

With 70% of congenital disorders being preventable, designing and implementing evidence-based community genetics services in India is extremely important[18]. Aiming towards improving the likelihood for having healthy babies, effective community genetic services should include services to avert the occurrence of congenital disorders as well as ensure the availability of genetic treatment services to communities[41-44].

Genetic services in India started with the establishment of Indian Council of Medical Research-funded genetic units in Delhi, Lucknow, Bangalore, Mumbai, and Pune which were engaged in multi-centric research programs for prevention of neural tube defects, etiological diagnosis of mental retardation and high-resolution cytogenetics in 1980[32]. Fig 2 depicts current status in India



However, despite all these services and strategies, huge gap in periconceptional care and counseling (about 22.8% pregnant female did not receive any ANC care and 33% received any ANC care only after 4th month), high unplanned pregnancies leading to improper folic acid supplementation, decreased iodized salt consumption (only 50% pregnant women used iodized salt), incomplete MMR immunization coverage in pregnant women (85% of women entering pregnancy have Gig antibodies to rubella), highly anemic women, both during pregnancy (59%) and breast-feeding (63%) and high exposure to teratogens[18,32] result in congenital disorder persisting as a critical cause for infant mortality in India. Two crucial reasons for this includes availability of genetic services in cities/selected premier institutions and hence catering mare to urban India than rural dwellers[32] and an absolute absence of either a written mandate or uniformity in the provision of genetic services to communities in India[32].

Congenital disorder as a national agenda

Congenital disorders were accepted as national agenda under the Country's Action Plan for Global Strategy for the Prevention and Control of non-communicable diseases in 2008-2013[18]. Consecutively few more initiatives like sickle cell anaemias control program in Gujarat/National Nutritional Anemia Prophylaxis/National Goiter Control Program, population-based carrier screening for beta thalassemia etc have been launched to target specific issues or particular congenital disorder in isolation[32]. In 2013-2014, as a response to combat the rising numbers of congenital disorders in the community and to address all birth defects under one umbrella, the Ministry of Health and Family Welfare, Government of India launched two new programs, National Child Health Screening and Early Intervention Services (Rashtriya Bal Swasthya Karyakram) and India Newborn Action Plan (INAP)[2]. The prime goal of both these programs is to integrate community genetic services with existing health care services (from primary to tertiary levels) and ensure accessible and affordable genetic services to communities.

National Child Health Screening and Early Intervention is aimed to improve the overall quality of life of children through early screening, detection and management of 4Ds -Defects at birth, Diseases, Deficiencies, Development Delays and Disabilities. It includes screening of children from 0-18 years for 30 identified congenital disorders [6]. Table 3 provides details of the program

Table 3 National Child Health Screening and Early Intervention implementation plan

Target Group	Implementation component
For New born	• Facility-based newborn screening at public health facilities, by existing health manpower • Community based newborn screening at home through ASHAs for newborn till 6 weeks of age during home visitation
For children 6 weeks to 6 years	• Anganwadi Center based screening by the dedicated Mobile Health Teams
For children 6 years to 18 years	• Government and Government aided school based screening by dedicated Mobile Health Teams.
Facility based newborn screening – This includes screening of birth defects in institutional deliveries at public health facilities, especially at the designated delivery points by ANMs, Medical Officers/ Gynecologists. Existing health service providers at all designated delivery points will be trained to detect, register report and refer birth defects to the District Early Intervention Centers in District Hospitals.	

Source: Operational Guidelines for Rashtriya Bal Swasthya Karyakram Child Health Screening and Early Intervention Services under NRHM (2013)

INAP was launched as country's response to WHO's Global Every Newborn Action Plan. Emphasizing on maternal and child health, INAP aims at integration of efforts/approaches for prevention and care of newborn with birth defects into primary health care[2]. Integrated and delivered through existing Reproductive Maternal Neonatal Child and Adolescent Health program, among the six pillars of this intervention, includes Pre-conception and antenatal care; Care during labour and child birth; Immediate newborn care; Care of healthy newborn; Care of small and sick newborn; and Care beyond newborn survival across various stages with specific actions to impact stillbirths and newborn health. The care beyond newborn survival intervention deals with combating birth disorders health[47].

Current impediments limiting community genetic services in India

Though well-defined health service organization in India makes it easier to integrate community genetic services with primary health care, there are several impediments limiting community genetic services in India. Figure 3 lists these impediments.

Deficient manpower, education and training

Currently there is about 50% shortage of doctors and 90% shortage of trained medical geneticists in the country. Existing geneticists are concentrated in the urban areas at selected premier institutions. This set-up is hence benefitting only the urban-rich while the rural-unreached remain to be neglected. Genetics is highly neglected in medical curricula of both undergraduate and postgraduate medical courses. This has led to lack of education and training of health professionals providing genetic services to communities in the country. Trained genetic counselors are scarce and access to educational material and genetic counseling for patients, families and public are limited.

Low priority and low budget allocation

Community genetic services suffer from low priority in the country. Sensitization of policymakers, health authorities and medical practitioners on the burden of congenital disorders is scarce. Since policy-makers buy-in is almost negligible, budget allocation to identify and manage congenital disorders is also extremely low.

Lack of Surveillance

There is inadequate data on the burden/epidemiology of birth defects, the need and demand for community genetic services and the quality, use and outcomes of existing genetic services in the country. Surveillance of congenital anomalies suffers massively in India due to lack of concrete evidence on which policies, programs and surveillance plan can be developed. Though multiple studies have been conducted in India on congenital

anomalies, there are huge disparities in the study results due to geographic variations of studies conducted and differences in data collection, methodologies, case definitions and many others.

Scarcity of infrastructure, equipments and legislative measures

There is an enormous scarcity of available laboratories for genetic testing and counseling in comparison to huge population of the country. This is coupled with quality assurance and patient safety issues. Although multiple regulations have been designed to regulate prenatal diagnosis, their strict enforcement is still questionable. When new tests are available in the country, there is a lack of official framework for assessing new genetic tests as well as absence of a formal system for approving these tests to be used clinical setting. Though there are ethical guidelines in maintaining privacy and confidentiality during prenatal testing and counseling, the enforcement and adherence to these guidelines are not checked on a regular basis.

Research in genetics – a low priority

There is very little research in the field of genetic disorders in the country. With scanty research-based evidence newer drug developments, newer therapies at affordable costs have become a major issue.

Fig 3: Impediments limiting community genetic services in India[12, 18, 32, 34, 48-50]

CONCLUSION

Success of community genetic services in India is dependent on multiple factors. These include

- Establishing a good surveillance system to collect accurate epidemiological data on congenital disorders on which country and context-specific interventions can be designed
- Improved understanding on community's needs and demands, gaps in existing community genetic services and ways to ensure a culture-sensitive approach to handles issues
- Greater participation and involvement of private and informal health sector, communities and consumers who access community genetic services in seeking suggestions for addressing the problem and improving its management
- Reducing the urban rural divide in accessing genetic services and tackling the barriers/challenges to itsutilization
- Simpler, cheaper, rapid screening, diagnostic and management tools to identify, treat and manage congenital disorders
- Commitment by policy makers and greater buy-in from health authorities to combat the problem
- Increase GDP expenditure on health and greater direction of economic resources to reach the far, rural communities
- Greater emphasis on the provision of preventive, promotive and rehabilitative measures for congenital anomalies at primary, secondary and tertiary health-care levels – this includes increased awareness on the importance of antenatal care, prenatal diagnosis and genetic counseling, community-specific educational programs on congenital malformations, population screening, ensuring the availability of early diagnosis and highlighting the negative impact of consanguineous marriages
- Accelerating research and providing research-based evidence to create policies, programs and affordable newer therapies

Conflict of Interest – None

Source of Funding- Self

Ethical Clearance – Not needed

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Stakeholder Collaboration Model to Empower Integrated Health Education Centers for Non-communicable Diseases : A Study in Bengkulu

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ABSTRACT

Integrated Health Education Center for Non-communicable Disease (IHEC for NCDs) is a means for a community to participate in doing early detection, prevention, and control of non-communicable diseases. Stakeholders and society play very important role in empowering IHEC for NCDs. This study aims to develop a model of empowering IHEC for NCDs by increasing the role of stakeholders.

The study uses a combination approach dan exploratory design and sequential procedures. Qualitative method is used to explore the roles of stakeholders in 10 IHEC for NCDs while quantitative one conducted in 67 IHEC for NCDs is aimed to prove the role of stakeholders in empowering IHEC for NCDs.

Stakeholders play a role in the process of formation, preparation for implementation, monitoring and evaluation of the empowerment of IHEC for NCDs using collaboration model. Collaboration model is implemented at all government levels with the aim of empowering people in accordance with the performance indicators of each stakeholder.

Stakeholder Collaboration Model for the IHEC for NCDs empowerment has increased early detection, prevention, and control of non-communicable diseases in the community.

Keywords : *IHEC for NCD, Stakeholder, Community Empowerment, Collaboration Model.*

INTRODUCTION

Non-communicable diseases can be prevented through effective intervention against the risk factors such as tobacco use, unhealthy diet, physical inactivity and use of harmful alcohol[1]. Integrated Health Education Center for Non-communicable diseases (IHEC for NCDs) and community participation in early detection, prevention, and control of non-communicable diseases (NCDs), are now widely developed in Indonesia. Community needs to identify their needs and assets while stakeholder needs to help provide tools and resources required to develop a health plan[2].

However, the role of stakeholder and the function of cadre are not yet optimal due to lack of knowledge and skills in related aspects of empowerment. This makes the use of IHEC for NCDs is not yet optimal. Collaboration is an arrangement in which one or more of the stakeholders are directly involved in the formal decision making process which is aimed to find agreement, make and implement public policy[3].

Public Health Centre (PUSKESMAS) as the responsible part, needs to search a model of stakeholders collaboration in empowering the IHEC for NCDs. Empowerment by moving the social capital is an opportunity to intervene community empowerment[4].

The effectiveness of prevention and control of NCDs needs leadership, coordination of multi-stakeholder and multi-sectoral action at the level of government and with various actors, including partnerships with civil society and the private sector which is in accordance with the health policy[5].

The research objective is to create a model of collaboration of stakeholders in empowering IHEC for NCDs in order to increase the willingness of society to do early detection, prevention and control of NCDs.

MATERIAL AND METHOD

This study employed both qualitative and quantitative methods and exploratory design with sequential procedure, which is first qualitative and then quantitative[6].

Phase I: conducting an evaluation study, with the exploratory design using qualitative method in 10 IHEC for NCDs to determine the roles of stakeholders in the utilization of IHEC for NCDs. Data validation was done in four ways, namely: credibility, transferability, dependability, and confirmability in each process.

Phase II: Developing hypotheses to determine the relationship of independent variables, namely: the role of stakeholders in the process of formation, preparation for the implementation and monitoring, and evaluation. The dependent variable is IHEC for NCDs and the population is all IHEC for NCDs in 10 districts in Bengkulu Province, whiich in total is 191 units. Stratified random sampling and cluster sampling is used to determine the residences/cities. Thus, 3 cities and 79 IHEC for NCDs are used as sample for this study. Then, determination of a number of samples using Slovin formula, is done with a confidence level of 5%, results in 67 IHEC for NCDs.

Phase III: Developing policy formulation for model of stakeholder collaboration in the empowerment of IHEC for NCDs using the concept of health care policy triangle: a) a stakeholder analysis; b) strategies for policy change; c) positions, power and perception; d) the process of policy analysis; e) data analysis: implementation of policy triangle[7].

RESULT

The Role of Stakeholder in Empowering IHEC For NCDs

The evaluation study to the 10 IHEC for NCDs shows the collaboration of stakeholder in empowering IHEC for NCDs during the process of formation, preparation and monitoring and evaluation, involving 1) Head of the District; 2) Head of the village; 3) Chairman of the Neighborhood/Village Chief; 4) The District Health Office/City; 5) Head of Puskesmas; 6) Cader; 7) Activator Trustees of Family Welfare concluded Table 1.

Table 1. Stakeholder Collaboration in the Empowerment of IHEC for NCDs

IHEC for NCDS	Establishement Process						Preparation for Implementation							Evaluation and Monitoring							
	Stakeholder						Stakeholder							Stakeholder							
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
A	V	V	V	V	V	V	-	V	V	V	-	V	V	-	V	V	V	V	V	V	-
B	V	V	V	V	V	V	-	V	V	V	-	V	V	-	V	V	V	V	V	V	-
C	V	V	V	V	V	V	-	V	V	V	-	V	V	-	V	V	V	V	V	V	-
D	-	V	V	V	V	V	-	-	-	V	-	V	V	-	-	-	-	V	V	V	-
E	-	V	V	V	V	V	-	-	-	V	-	V	V	-	-	-	-	V	V	V	-
F	-	-	-	V	V	V	-	-	-	-	-	V	V	-	-	-	-	V	V	V	-
G	-	-	-	V	V	V	-	-	-	-	-	V	V	-	-	-	-	V	V	V	-
H	-	V	-	V	V	V	-	-	V	V	-	V	V	-	-	-	-	V	V	V	-
I	V	V	V	V	V	V	-	-	V	V	-	V	V	-	-	V	-	V	V	V	-
J	-	V	V	V	V	V	-	-	V	V	-	V	V	-	-	V	-	V	V	V	-

Source Data: primary data processed

Table 1 shows that majority of stakeholders have worked together during the process of the establishment, preparation of the implementation, monitoring, and evaluation of IHEC for NCDs.

Analysis role of stakeholders in the process of establishment, preparation, monitoring and evaluation of the empowerment of IHEC for NCDs is presented in Table 2.

Tabel 2. The Role of Stakeholder in the Establishment, Prepartation of the Implementation, and Monitoring and Evaluation of IHEC for NCDs

Research Variabel	**Utilization of IHEC for NCDs**				**p value**
	Less		**Good**		
	F	**%**	**F**	**%**	
Establishement					
Less	30	73,2	11	26,8	0.993
Good	19	73.1	7	26.9	
Implementation					
Less	44	75.9	14	24.1	0.201
Good	5	55.6	4	44.4	
Monitoring Evaluation					
Less	47	44.6	14	23.0	0.021
Good	2	33.3	4	66.7	
Source Data: primary data processed					

Table 2. reveals that stakeholder have less role in the formation and preparation for implementation but a better role in the implementation and the monitoring and evaluation, which give a good impact on the empowerment IHEC for NCDs. Multivariate analysis results in 6.7 for a better role of monitoring and evaluation in order to increase the empowerment IHEC for NCDs.

Stakeholder Collaboration Model for Policy Analysis

Analysis of stakeholders' role is based on place of work, duties, functions, resources, partners, knowledge and skills, as well as performance indicators. The results of the analysis of the empowerment policy triangle IHEC for NCDS can be seen in Table 3.

Tabel 3 : Triangle Analysis of Empowerment Policy of IHEC for NCDs

Stakeholder	Context, Content, Process
Health Institution (Dinas Kesehatan)	Participate in Health Institutions as organizers of IHEC for NCDs. The process begins with socialization and advocacy to relevant stakeholders concerning the developmen t, monitoring, and evaluation of IHEC for NCDS
Public Health Center (Puskesmas)	Play a role as an organizer of IHEC for NCDS in the environment of the public health and for public in the working area. The process begins with socialization and advocation to relevant stakeholders concerning the implementation, supervision, monitoring and evaluation of IHEC for NCDS. IHEC for NCDS is an effort to increase visits by the people of health insurance.
The Head of sub-district (Kecamatan)	Plays a role in the government, private sectors and community in the work area for community mobilization and socialization monitoring of IHEC for NCDS
The Head of Kelurahan	Play a role in the neighborhood (RT and RW), private sectors and community in the work area to mobilize community and monitoring of IHEC for NCDS
The Head of RW	Plays a role in the neighborhood (RT and RW) to mobilize a community to take advantage of IHEC for NCDS
PKK	Play a role in the area of PKK empowerment, private and public sectors in the work area to mobilize community and monitoring of IHEC for NCDS

Source: primary data processed

Intervention by Collaboration of Stakeholders

Stakeholder and the staff and cadre of the health center work together in socializing the goals, activities, and benefits of IHEC for NCDs to 366 patients who visited the health center. This results in increasing visit to the IHEC for NCDs where 350 people (95.8%) know and understand the benefits of the activities and willing to come to IHEC for NCDs. Stakeholders and cadres, head of the village, head of the subdistrict, PKK and the community health centers also do an intervention by inviting people and doing dissemination to public in 6 (six) IHEC for NCDs. The results of the intervention is an increased utilization of IHEC for NCDs from the month I to the month IV, as shown in Figure 1.

Source: primary data processed

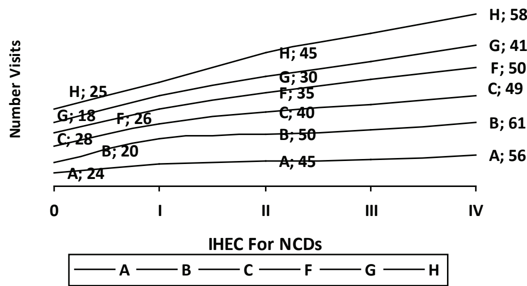

Figure 1. The Increase of Visitation to IHEC for NCDs after

Intervention of Stakeholder Collaboration

DISCUSSION

Stakeholder Colloboration Model For the Empowerment of IHEC for NCDs

Stakeholders collaboration can coordinate its resources together to mobilize people to use IHEC for NCDs. Community empowerment strategies through mobilizing social capital owned by the community is an opportunity to intervene community empowerment. Community interventions are organized in five phases: a) building trust, b) increasing the awareness, c) developing programs, d) organizing communities, and e) the initiation of maintenance program[4].

Prevention and control of NCDs to society requires the collaboration of all stakeholders who have a concern in the issue. Cardiovascular prevention and rehabilitation, which is one of the NCDs, requires concerted action by all stakeholders to achieve improved health behavior at the global scope. Model connectivity can enhance communication, collaboration, and creativity to encourage people to behave in healthy life[8].

Stakeholders must perform community empowerment approach in order to improve the utilization of IHEC for NCDs. Multi-sectoral collaboration can create an environment that supports a healthy lifestyle for community[4]. Community empowerment requires the role of local government that has the task of empowering communities by increasing knowledge and understanding of risk factors and prevention of NCDs to society which will increase the impact to IHEC for NCDs. Local government can mobilize support and social networks, as well as play an active part in the community life[9].

Stakeholder collaboration is done routinely every month empowering the IHEC for NCDs. Evaluation of the role of appropriate tasks and functions of each part is optimized, so it may result in improvement every month. The success of stakeholder collaboration to empower the IHEC for NCDs is performing the integration tasks and functions of each stakeholder. Based on a research by Ansell et.al, successful collaboration is obtained by conditioning the institutional design and leadership variables. Collaboration is begun by setting the level of trust, conflict and social capital which is the source, or obligation, during the activities are in progress. Institutional design establishes ground rules of collaboration in progress and provides mediation and facilitation of leadership. It is important to the collaborative process to be repeated[3]. According to Arena et.al (2015), the key role of stakeholders as a whole in developing a healthy behavior is to perform the role of the community in accordance with the duties and functions of their respective organizations[10].

Government plays an important role at all levels in collaborating with all stakeholders to empower IHEC for NCDs, and in improving the early detection, prevention and control of NCDs in the community. The role of stakeholders is continuously developed based on available resources to optimize collaboration for empowering IHEC for NCDs.

Analysis of Stakeholder Collaboration Model Policy

The health office city and Public Health Center have collaborated and worked together with other stakeholders who have duty, function, resources, partners, performance indicators to empower IHEC for

NCDs. All stakeholders are involved in the process of formation, preparation for implementation, monitoring and evaluation of IHEC for NCDs. Public Health Centers, in collaboration with other stakeholders, mobilize communities to use IHEC for NCDs.

The role of stakeholders, including all groups and elements from the Provincial Health Office, the PKK Province and PPK Village, the District or City Health Office, the Community Health Centers, the District/City Health Forum, the Heads of Sub-District, the Chiefs of Sub-districts, the Chairmen of the Neighborhood can be designed as a model of collaboration of stakeholder in empowering IHEC for NCDs. Public participation should be designed and informed by the relevant local institutions or those who are sensitive to the key principles and governance arrangements. Key principles should be considered in the implementation of existing stakeholder participation in the process of public engagement[11]. Lasker suggests that collaboration will happen if there is limited resources, a common vision, and allows problems to be solved together[12]. Goldman (2016) says, society requires institutions to collaboratively improve the health status, address shortcomings in infrastructure and preparedness efforts community[13]. Society needs to gain an understanding of IHEC for NCDs and non-communicable diseases, and knowledge of the benefits or advantages of IHEC for NCDs.

CONCLUSION

Stakeholder Collaboration Model of IHEC for NCDs can improve utilization of IHEC for NCDs by the community in the early detection, prevention, and control of NCDs. Stakeholder Collaboration Model of IHEC for NCDs can be developed in parts of Indonesia and other countries that have the role of stakeholders to empower people at all levels of government.

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Safety of Doctors at their Workplace in India: Perspectives and Issues

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ABSTRACT

The sincerity and diligence of health care providers regarding their timely interventions for the spectrum of ailments at all levels of stressful occupational environments even in the usual infrastructure poor compromised health care facilities of hospitals in our country is appreciable. In last one decade the scenarios evidently showed that integrity and trustworthiness of health care providers are being questioned by the health care seekers in spite of well known fact of widespread deficiency of basic amenities. As the downstream effects, all the unfulfilled expectations of receiving comprehensive public health care are being vented out as the wrath to the doctors leading to series of attacks on doctors and creating chaos in the health care facilities of all levels across the country. The source of this intolerance towards health care providers stems from higher expectations (? magic cure for all morbidities) from doctors on one hand and the limited health awareness, education of patients and their caregivers (attendants and bystanders) on the other hand. There is multifactorial causation of this sensitive issue that is increasing at an alarming momentum as the doctors are treated as 'soft targets'. The primary aim of this article is to sensitize stakeholders and policy makers regarding barbaric attacks on the modesty of doctors; secondly to strengthen the awareness of first contact physicians of the legal and administrative safety measures to protect themselves from the unpredicted situations of outrage and distrust.

Keywords: *attacks on doctors, stakeholders, preventive measures, consequences*

INTRODUCTION

World Health Organization (WHO) reported that up to 38 percent of health workers of different countries experience physical violence at some point in their professional services. [1] Indian Medical Association (IMA) has also reported that three-fourths of doctors have faced verbal abuse or physical violence during their lifetime, while resident doctors are exposed more in their workplaces as they usually face the critical situations as first-contact physicians. [2] Similar incidents are also reported in neighboring countries like Bangladesh, Pakistan with almost similar health indicators, literacy, income, social economic status and health care infrastructure.[3] A study by Hongzing Yu et al from China has also highlighted numerous cases of violence against healthcare professionals leading to death of some doctors as well as nurses by patient's relatives.[4] Recently a review on 'Workplace violence against health care workers in the United States' shows that abuse against this noble profession has become a global phenomenon. [5] Both the severity and number of incidents has shown shocking increments as more and more reports are pouring in everyday. There is silver

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lining that after so many incidents in recent past the professional bodies of doctors have also been proactive to come down on roads with their range of programmes to protest against verbal abuse, harassment and physical assaults as well as innovative plans protection of doctors at their workplaces. The primary aim of this article is to sensitize stakeholders and policy makers regarding barbaric attacks on the modesty of doctors; secondly to strengthen the awareness of first contact physicians of the legal and administrative safety measures to protect themselves from the unpredicted situations of outrage and distrust.

PERSPECTIVES OF VARIOUS STAKEHOLDERS

Patient context

Overall, the researchers have noted that the major grievances leading to abuse and harassments of doctors often crop up from perceived need on the insufficiency of appropriate management at hospitals; these often tantamount to the medical negligence in the legal parlance. But generally, it can be summed up that the patient or patients' bystanders, caregivers and accompaniments might have been intoxicated with alcohol, attack might also have been aggravated by stress due to poor communication, financial loss and longer waiting time.[6]

In absence of basic understanding of the 'Natural history of disease' and 'Web of causation' of morbidities amid very high expectations, the care-seekers usually have imaginary rapidity of process of diagnosis and perceived 'magic remedies' for overt as well as rapid improvement of patients. Further, with a hope for complete and quick improvement of their near ones, they usually remain in an emotionally unstable, irrational, charged state, especially anxious to know about the prognosis of their patients particularly when the patient is a child, adolescent, youth and pregnant mother. Also at times physicians take the care-seekers for granted (low priority) in providing health care without considering their anxiety, concern and emotional attachment with their patients.

Physician context

It is usual scenario in most of the hospitals that the recent pass out doctors man the critical care as first care physicians. Their knowledge may be sound but deficiency of their interpersonal communication skills and experience for multi-tasking makes them vulnerable to the wrath of the patients and their caregivers.

In our experience, the opinion of junior doctors regarding their long working hours, continuous shifts including night shift and communication gap with senior doctors are usually than not taken care of. Even the parents of doctors worry about the safety of their children, especially about girls, because of previously reported incidences of brutal crimes committed within the hospital premises. [6]

There is sheer absence of any plan to anticipate disagreement of the patient's accompaniments such attacks and failure to protect their doctors in their premises. This leads to increased hazardous exposure in absence of safety arrangement of doctors by especially during night shift and weekends. The reasons may be many for suboptimal care of the patients including paucity of senior doctors in the administrative ladder as well as consultants for decision and/or second opinion, increased workload, consequently exhaustion leading to reduction in critical thinking among others. To add to these problems literature reported that doctors especially females were more dissatisfied on a night shift than working on day shift.[7]

Most attacks on doctors and medical staff by relatives of patients go unpunished. There have not been arrests in most cases of destruction of movable and immovable properties in the hospitals and cognizable and non cognizable offence on doctors.

PREVENTIVE MECHANISMS

Doctor by virtue of their professional ethics, tries his best to heal the patient going through his sign, symptoms and investigations, to the best possible optimization of outcome. Depending on the natural history of the disease and various stages of etio pathogenesis, a physician diagnoses a disease on a spectrum of signs and symptoms. A differential diagnosis is made by judgments from a bunch of possible definitive diagnosis with a chance of error embedded in the whole process of diagnosis and management. Further, in Government set up best possible treatment can't be given due to resource constraints. Moreover, in the drug human interface, there are many unpredictable factors, which may decide the prognosis and outcome. The actions needed to prevent these act of vandalism from primary to secondary level

of prevention in form of immediate to long term plans have been provided in form of a checklist in table 1.

Prevention is better than cure (Primary prevention)

Neither patient nor the health care providers want to get into any type of conflict. The former wants to get appropriate and prompt treatment whereas the latter with a noble conscience and with all his knowledge, experience and expertise wants to cure the patients as soon as possible.

Now, in the era of Consumer Protection and Rights Act (COPRA), a doctor may be sued in the court of law for not advising an investigation. On the other side if he does so, it sometimes leads to allegations by patient and his attendants for unnecessary investigations. So, it is Hobson's choice for the treating physician.

The patient and his family should be informed about 'What they should do' when patient's condition worsens during treatment at the hospital. When the patient's condition is critical, there should be a documented system of regular communication and updates with the family regarding the condition of patient.[7]

What a patient should do

A patient should get all the information about the disease, expenses, best possible treatment, alternative treatments and its prognosis. Patients and attendants are also expected to show empathy and co-operation if a doctor has to attend 40-50 patients and that for doctor every patient has equal importance. Patients and attendants should try to understand that doctor will be able to give best possible medical treatment to best of his knowledge and conscience. They should try to reach to the hospital as earliest possible time and that too with all related documents and investigations. If anyone is not satisfied or doubts any medical negligence, the option of filing a complaint in police, state medical council, Indian medical council, national and state medical association and in the court of law is always available which will make their case strong.

What a doctor should do

Every doctor has the responsibility to show competency with scientific knowledge intermingled with empathetic communication skills during interaction with patients and their caregivers. Further in the fast moving technological and scientific discoveries, doctors need to be updated with state-of-art clinical practice guidelines regarding diagnosis and prognosis of spectrum of common medical problems.

Even if the health care providers might have been over-worked and burnt out, they should behave empathetically with delivery of best possible clinical acumen in the infrastructure and logistics available on the spot, because they have opted out this profession by choice, knowing all these nitties and gritties.

Another review described that improved communication between doctor and patients could result in increased patient satisfaction, enhanced patient compliance with clinical competency of the treating doctors with optimized treatment regimens, and reasonably as well as expected improvement of the clinical outcomes.[8]

Self defence training

The apex institute of the country at New Delhi organized self-defense classes for doctors to learn taekwondo to defend themselves from kin of patients.[9] Some of the hospital authorities across the country are organizing 'Marshal arts', 'Karate' etc. training programmes for their health care delivery personnel so that they can save themselves and their colleagues in any unexpected situation during discharge of their duties inside their health care premises. This will definitely reduce personal trauma and harassment by increasing confidence. But the self defense is of less use in the cases when a mob attacks a single health professional, we cannot expect him/her to fight them and save himself in "Rambo style".

Role of Nursing Home Cell

Nursing home cell is a cell by state governments to ensure the better coordination with the nursing homes. Nursing home cell should be also taking care of preventive and protective measures to safeguard the rights, safety and security of health care workers. There should be a Rapid Response Team (RRT) and helpline number, which should be given to all the small health care organizations (HCOs), which can be a single point of contact from safety to legal measures to facilitate all kind of activities related to such event. An expert committee should take the case and time bound reporting to the higher authorities should be done.

Establish liaison with local police

There should be a panic button for health care workers in the premises. This in conjunction with signage with a warning that any harm to health care staff and property will amount to non cognizable offence will have a greater impact. Considering the moral duties, certain guidelines are to be followed so that they get shelter/s from local political systems.

Even though one constable is allocated to most of the government hospitals permanently for medico legal cases, but due to lack of accountability in vandalism cases, they do not take necessary and timely action. Feasibility of a police team at all hospital emergencies should be made. Either separate cadre or any paramilitary force should be made responsible for safeguarding this frightened and scared medical fraternity who is living under continuous fear to be manhandled and killed.

Role of Medical Councils and Medical Association

Indian medical council and private medical associations should protect their members. They should be a part of the forum/platform, which should be created to safeguard the rights of individual doctors and small HCOs.

All the state branches of the Indian Medical Association (IMA) and their city and district branches should establish patient grievance redresser cells to look into complaints of medical negligence under their respective areas. They should be a part of the forum/platform, which should be created to safeguard the rights of individual doctors and small HCOs.

The state and district IMA branches should organize discussion, representations and meetings with the police personnel and administrative authorities regarding avoidable atrocities and injustice against doctors within the legal framework.

Role of Government, policy makers and hospital administration

Health is a state subject as per Indian Constitution. Yet, even after seven decades of independence with so many regulatory and administrative reforms, 'health of the people' has not been set as a priority by successive ministries and Planning Commissions. Intolerance has been fuming in the community at large regarding deficiency of basic health care. On the other hand, the administrative authorities of the hospital are keeping a 'blind eye' regarding provision and promotion of violence free workplace and adoption of 'zero tolerance' policy. So time has come when doctors should take all necessary precautions to reduce and eliminate risk with associated 'professional hazard'.

Further, political and religious leaders have a moral and ethical responsibility to start talking to people with the convincing note that, even after the path-breaking scientific discoveries, the medical science has limited curative solutions to uncountable health problems even in the resource rich settings. For this, hospital authorities should recruit Liaison Officer under whose leadership a group of counsellors will continuously monitor and counsel the patients and their accompaniments.

There should be trained hospital administrators round the clock in all the hospitals, which ensure all kind of problems of patients and care givers and can take prompt and suitable measures to avoid such attacks. Patient to doctor ratio should be monitored continuously and allocation of permanent and contractual staff should be done accordingly. Matching with the patient load, bed capacity increment should be foreseen and implemented.

Last minutes to implement the idle Legislations

As a result of increasing violence against doctors and destruction in hospital campuses by patients and their relatives, few state governments has passed state Act for the safe guard of treating first contact physicians e.g. Maharashtra, Haryana, UP, Tamil Nadu etc., but it has not been implemented even in those states effectively due to resistance from administration for reasons better known to them. Due to increasing number of attacks on doctors, Karnataka state of India has passed prevention of violence and damage to property bill, 2008 to create safe environment for their work.[10] According to an ordinance passed in March 2009, anyone who indulges in violence against Medicare service persons or damages or causes loss to the property of a Medicare service institution will be punished with imprisonment up to three years and a fine of Rs 50,000.[11]

Action to be taken when Violence Occurs (Secondary prevention)

Immediate action

The immediate action to be taken is to alarm

police and call rapid response team or maximum well wishers who can come to rescue including staff. We need to depute someone (preferably beforehand) to take photographs and, even, recording of events leading to violence. Also depute someone to immediately get ready with copies of medical record of the patient (at least three copies). These will be useful for the caregivers of the patients, police and the court of law. If the mob carries away the original record, the copies will be useful.

Concurrent action

Identify the troublemakers/leaders in the mob and talk to them and try to pacify them, even though you may have to go out of the way to a certain extent. Lodge first information report (FIR) with the nearest police station with concurrence from the head of the health care delivery centre (it is better to let the advocate prepare the FIR).

Medium term action

The aggrieved doctor should not be left alone. The local medical association should provide him all support in the interest of the profession. If the health care provider has any of the professional indemnity policy, they should inform them as early as possible to get legal and administrative help from them.

Long term actions

Police should be urged to take prompt action to prevent ramification of the incidence and then if required handle such situation by reacting proactively and sensitively. Most attacks on doctors and medical staff by relatives and bystanders of patients go unpunished. There have not been arrests in most cases of vandalism in hospitals and assaults on doctors as.

CONSEQUENCES (WHERE ARE WE LEADING TO)

These incidences of increasing violence against doctors might demoralize aspiring students to choose medical profession, or increase brain drain, which might jeopardize the future of our healthcare, as the doctors are still not sufficient in our country. A defensive strategy involves shunting complicated cases to other clinics and hospitals, with the delay actually magnifying the health risks in some cases and referrals just add to the frustration among the caregivers of the ailing patient/s. Also the prevalence of stress among the young doctors is on rise.[12]

Strike by health care staff

Strike is a one of the nonviolent and legitimate form of protest in a democracy, which is done collectively in mass mostly to get one or more demands to be fulfilled.[13] Two of the most sustained and threatening strikes by health care providers occurred in Canada and Belgium. [14] Physician in India either in private or public sector are undergoing alarmingly increasing number of strikes in last few decades. Under Hippocrates oath, care of the patient becomes a contractual obligation for the doctors and is superior to all other responsibilities.[15] Utilitarian perspective views doctors' strike justifiable.

ESMA stands for Essential Services Maintenance Act; says that people employed in certain essential services which would affect normal life of citizens cannot pen down when the government asks them to work.[16] In some situations, without getting any way out, when the health care providers are forced to go for strike in desperation, even than they need to ensure that no one in critical condition suffers due to strike to prevent isolation from common mass in general. There is much increase in number of incidents of strikes due to attack on doctors. Strikes may provide an outlet for outrage, but they also lead to neglect of countless other patients. It has been observed that nursing homes have started shutting Intensive care units. It will have double jeopardy.

Table 1: Preventive measures: Vandalism and survival checklist

Preventive Measures	Initiatives	Poly clinic/ Private Clinics	Small HCOs(< 100 beds)	Bigger Private Hospital(≥ 100 beds)	Govt. Hospitals and Medical Colleges
Immediate /Short Term	System for early identification of potential dangers and informing core team available in the facility	x	x	x	x
	Formation of rapid response team including all class of employees, who can reach earliest to the health care facility		x	x	x

Cont... Table 1: Preventive measures: Vandalism and survival checklist

	Deputation of Dedicated private security team/ PCR/Police post		x	x	x
	Closed Circuit Television (CCTV) installation for all high risk zones like emergency and intensive care units	x	x	x	x
	Introduce Access control and access cards		x	x	x
	Display of the Relevant act, If available and its penalization at most prominent places inside the premises.	x	x	x	x
	Self defense training	x	x	x	x
	Taking identity proof (unique identity proof) of patients (at the time of admission) and attendants not late than 24 hours of admission		x	x	x
	Written undertaking of the patient and at least two caregivers for compensation of penalty and damage of the hospital property in case of vandalism		x	x	x
	Establish liaison with local professional bodies and medical association	x	x	x	
	Establish liaison with police, administrative bodies and Media		x	x	x
Medium Term	Establish liaison and Security Alarm attached to nearest police station	x	x	x	x
	Video recording of all the estimates (in case of private hospitals), consent and daily updates		x	x	x
	Vandalism Drills including all stakeholders		x	x	x
	Review of Patient doctor ratio and allocation of manpower to the patient load		x	x	x
	Formation of Vandalism prevention committee and audit to take corrective actions for incidents			x	x
	Establish liaison with local nearest community groups like Resident Welfare Associations, clubs, etc., in case of danger		x	x	x
	Dedicated team for chaplain service for moribund patients		x	x	x
Long Term	Formation of dedicated wing under Central armed police force/Paramilitary or Deployment of military at hospitals		x	x	x
	Department of hospital administration/ Hospital administrators should be inducted in every hospital	x	x	x	x
	Separate cadre for counselors/medical Social Worker/ Chaplain service for non medical works so that doctors can utilize their time in medical care		x	x	x
	Expert committee on state and central basis to do the RCA and take the corrective and preventive measures, time bound reporting and legal coordination, s including all the stakeholders doctors, nurses, paramedical workers, Local Members of Parliament and Legislative Assembly, Counselors, NGOs, media, and Police			x	x
	Monthly report by state police/Metro police to State Ministry of Health and Family Welfare	x	x	x	x
	Media coverage of positive activity	x	x	x	x

CONCLUSION

'Doctors can ensure care, not cure'- this dictum of the role of health care providers has been accepted universally and are being taught as biomedical ethics in the curricular training as per regulatory bodies. The soft approach to people who target hospitals and health workers encourages potential assailants. A no-nonsense attitude starting with the use of stringent sections of the law and ending with convictions in court-is needed to send out a strong signal. A knee-jerk response to every case of assault needs to be replaced by a long-term

policy that will also look at the dysfunctional public health sector, which may be the root cause of many of these attacks. Further if these types of relentless attack on this health care profession are unchecked by the policy makers, political leaders, regulatory bodies and administrative authorities, then brilliant students will be scared to opt for this profession and the needs of the people in health care will be disregarded by the backbenchers of the school.

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Effectiveness of Pranic Healing on Functional Health and Wellbeing of Inmate at Mysore Central Prison

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ABSTRACT

Background: Prisoner's long-term stay in solitary confinement can lead to disturbances in physical and mental health.

Aim: The aim of the present study is to learn about the impact of Pranic Healing (PH) in elevating the functional health and wellbeing of inmate. PH is an ancient science of healing. It is energy based complementary therapy which utilises prana or vital energy as a major source for healing.

Setting and Design: Single group pre-test post-test design was used in the study. This study involved 38 inmates of Mysore Central Prison. All the participants were male with an average age of 42.8 years.

Method: The functional health and wellbeing were measured using COOP/WONCA Charts. After recording the pre scores, 3 healing sessions of 20 minute duration each were applied on each participant in a week's time. Once the three healing sessions were over, post scores were recorded.

Statistical analysis: The Pre and Post PH scores were compared and analysed using descriptive statistics and contingency coefficient tests.

Results: Significant change were observed in six domains after the intervention period, which were Physical fitness ($p=.016$), Feelings ($p<.001$), Change in Health ($p<.000$), Overall Health, ($p=.043$), Pain ($p<.000$) and Sleep ($p=.006$). However, there was no significant change observed in social and daily activities domain.

Conclusions: This result provides initial evidence that PH benefits on some major domains of functional health and wellbeing of inmates.

Keywords: *Inmate; Functional health; wellbeing; Pranic healing; Prana*

INTRODUCTION

A prisoner also referred to as an inmate, is a person who is deprived of liberty against their will. Being in prison is a punishment with far reaching implications for the person's physical and psychological functioning[1]. The most extreme adverse effects experienced by prisoners, appear to be caused by solitary confinement for long durations. This subjects them to sensory deprivation and lack of social contact which have a negative impact on their mental health. Long-term stays in lonely captivity can cause prisoners to develop heightened levels of personal distress, aggression, antisocial behaviour, substance abuse, depression, anxiety and insomnia[2].

Estimates from many countries propose that the prevalence of mental health problems in prisons is five times higher than in the general population[3]. According to the World Health Organization, of the nine million prisoners globally, at least one million suffer

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from common mental disorders such as depression and anxiety[4]. Mental health indicators in prison have been linked to violence, self-harm, suicide and victimization[5]. Such high prevalence rates of mental illness result in substantial mental health needs and pose many challenges to the criminal justice system. There is a growing need to heal prisoners minds and bodies and reintegrate them into society. Prisons are now being considered as reformatories and better awareness is being given to improve the conditions in jails so that they can create a strong impact on prisoners in developing positive attitudes towards life and society[6]

With the growing popularity of meditation and yoga, Prison Governors, and scientists have considered the use of applying these techniques to prisoners to improve their quality of life[2] Studies focused on meditation for prison populations have shown improved psychosocial function[7], reduced rates of recidivism[8], and decrease in substance use[9]. Together, these findings suggest that utilising these complementary techniques for prisoners might help in the management of criminal behaviour.

Pranic healing (PH) is a complementary technique, which utilises the prana or vital energy as its main source of healing power. It is a simple yet powerful & effective system of no-touch energy healing. It is based on the fundamental values that the body is a *self-healing* living entity that has the capacity to cure itself. Healing process is hastened by increasing this life force which is readily available from the sun, air and ground to address physical & emotional imbalances. The energy body has major, minor and mini chakras, just as the physical body has major and minor organs. The major chakras or centres not only control and energise the internal organs, but also control and affect one's psychological conditions[10]

There are numerous PH protocols that help to improve the physiological and psychological condition. They are based on seven basic techniques as follows 1) Sensitizing the hands, 2) Scanning the Aura, 3) Cleansing the aura, 4) Increasing the receptivity, 5) Energizing with prana, 6) Stabilizing the projected prana and 7) Releasing.[11]

Application of PH as complementary therapy has been found to be effective in various domains. PH is associated with significant reduction in musco-skeletal pain,[12] feeling and experiencing energy field or prana by participants,[13] increase in wellbeing by manipulating the energy fields of subjects.[14] PH is also being practiced by well-educated followers to achieve personal and professional growth.[15] It has also been applied in agriculture to improve plant yield and growth.[16] Objective evidence of benefits of PH for prisoners' wellbeing is as yet unavailable. This study was done to understand the effects of PH on prisoners' functional health.

METHODS

Participants: The participants chosen for this study were 38 inmates from the Mysore Central Prison. They were selected based on their interest in undergoing PH. These participants were of an average age of 42.8 years (range 28-65). All the participants were male with education qualification ranging from unschooled to Degree Those who have undergone PH previously were not taken in the study in order to meet exclusion criteria.

Procedure: Permission was obtained from Government of Karnataka, District AYUSH Body, Yadavagiri, Mysore to perform this study. Consent was obtained from the interested inmates after they attended the introductory talk about PH. Single group pre-test post-test design was used in the study. Further, COOP/ WONCA charts, pain and sleep questionnaire were used. After recording the pre scores, healing sessions were applied for 20 min for each participant. They were recommended to undergo 3 healing sessions in a week's time. On completion of the three healing sessions, post scores were recorded, and data analysis was carried out.

Tools

1) Functional health: CO-OP/ WONCA chart was used to access individual functional status namely physical, emotional and social well being as reported by Van Weel[17]. These charts measure functioning is six aforementioned domains: physical fitness, feelings, daily activities, social activities, social support, change in health and overall health. Each chart consists of single question referring to the previous two week and has five different answers illustrated by simple pictures. Higher scores indicate a worse functional status.[18] The test-retest reliability coefficient of the COOP function charts ranged over an interval of three weeks from r = 0.67to 0.82, Kappa's = 0.49 to 0.59, and over an interval of one year r = 0.36 to 0.72, Kappa's = 0.31- 0.38.

2) Pain questionnaire: To measure the extent of physical pain experienced by the inmates a new questionnaire developed by us was used.

3) Sleep questionnaire: To assess the quality of sleep experienced by inmates a new questionnaire developed by us was used.

Statistical Analysis: The data collected have been analysed using Descriptive Statistics - Contingency Coefficient and the results obtained have been interpreted.

RESULTS

The participants underwent COOP/WONCA charts, Sleep questionnaire and pain questionnaire and details tests along with statistical analysis are provided in Table 1.

The results show that there is a significant improvement in the physical fitness. It was observed that before PH, 18.4% had very heavy physical fitness, recorded an increase to 31.6% after undergoing PH sessions (CC=.312, p=.016). Before exposure to PH, 31.6% of the inmates recorded extreme level in the feelings domain but after PH, only 7.9% of respondents expressed that level of feelings indicating a significant improvement in this domain (CC=.456, p<.001). Further, there was a significant change in the health of inmates, 34.2% expressing that their health improved after undergoing healing sessions (CC=.471, p<.001).

There was a significant improvement in their overall health. While 18.4% respondents expressed that their health was very good before PH, percentage of respondents increased to 34.2% after PH(CC=.339, p=.043).There was significant improvement in their sleep. While 10.5% respondents said that their sleep was excellent before PH, 36.8% expressed so after the healing sessions (CC=.4, p=.006).It was also observed that 36.8% of the inmates experienced extreme levels of pain, but after PH, only7.9% felt extreme levels of pain (CC=.463, p<.001).

After PH sessions, analysis showed 18.4% inmates improved on 'could not do' and 'much difficulty' responses in their Daily activities domain, however the trend was insignificant (CC=.267, p=.210). In the Social activities domain, analysis showed 15.7% inmates showed an improvement in 'extremely', 'quite a bit' and 'moderately' responses which was not significant (CC=.216, p=.432) after PH sessions.

DISCUSSION

The results of this study were the first evidence for the benefits of PH on health and wellbeing of inmates. Overall, we found that prisoners, who were assigned to attend a 3 sessions of pranic intervention, reported significant improvement in functional health, specifically in domains of physical fitness, feelings, change in health and overall health of prison inmates. There was also significant improvement in reduction of pain symptoms and improved quality of sleep

The chakras that were cleansed and energised were basic chakra, front and back solar plexus chakras. These chakras are closely associated with lower emotions.[10] The other chakras such aajna, forehead, throatand heart chakra were also cleansed and energised based on scanning results.

More than 34% of inmates became more physically fit after PH sessions by running and jogging at faster pace which clearly indicates that PH had brought more strength and vitality among inmates.

Each negative thought and emotion creates packets of energy called thought-forms which could contaminate our aura. This contaminated energy in the aura in turn affects various physical organs and makes the person sick.[11] Problems related to stress, worry, tension and anxiety are the root cause of most of today's ailments. Using the tools of psychotherapy, these can be disintegrated helping the patient overcome their emotional problems much more quickly and easily. The Pranic psychotherapy protocols addresses this aspect by cleansing and energising all those chakras associated with lower emotions like fear, anxiety, anger. In the present study it is evidently seen that many inmates felt that after PH sessions they felt light and could overcome negative feelings.

There was significant improvement in the quality of sleep after PH. Sleep difficulties in adults are connected with psychiatric disorders such as depression, alcoholism and bipolar disorder.[19] In this study, during the interaction with the inmates it was found that many inmates had sleeping difficulties. As per PH findings, people with insomnia have over activated basic chakra and solar plexus chakra. By normalising these chakras of inmates, it was observed that inmates were able to

sleep better.

There was an improvement in daily activities of inmates after PH as additionally 18.4% expressed lesser difficulty in performing daily activities. Similarly, in social activities after PH, 15.7% inmates expressed better relationships with fellow inmates and family members. However, there was no significant improvement in both domains. Research and policy surrounding mental health intervention in prisons has mainly focused on psychological and psychosocial treatments. However, treatment provided by psychiatrists/ psychologists are pricey, and psycho-social treatments in prison are commonly found to be inaccessible and unwanted because of their time-consuming nature.[20,21]It is possible that intervention like PH may offer a more practical, socially acceptable and affordable alternative and can be used as a complement to other rehabilitation programmes.

Table 1: Pre-Healing and Post Healing scores of COOP/ WONCA charts along with Sleep and Pain questionnaires.

Domain	Responses		Pre		Post		CC	P
			f	%	f	%		
Physical fitness	1	Very heavy (run at fast pace)	7	18.4	12	31.6	.312	.016
	2	Heavy (jog at slow pace)	6	15.8	14	36.8		
	3	Moderate (walk at fast pace)	12	31.6	9	23.7		
	4	Light (walk at medium pace)	8	21.1	3	7.9		
	5	Very Light (walk at slow pace)	5	13.2	0	0.0		
Feelings	1	Not at all	3	7.9	7	18.4	.456	<.001
	2	Slightly	5	13.2	20	52.6		
	3	Moderately	10	26.3	5	13.2		
	4	Quite a bit	8	21.1	3	7.9		
	5	Extremely	12	31.6	3	7.9		
Daily activities	1	No difficulty at all	11	28.9	13	34.2	.267	.210
	2	A little bit difficult	9	23.7	14	36.8		
	3	Some difficulty	8	21.1	8	21.1		
	4	Much difficulty	7	18.4	3	7.9		
	5	Could not do	3	7.9	0	0.0		
Social activities	1	Not at all	16	42.1	16	42.1	.216	.432
	2	Slightly	10	26.3	16	42.1		
	3	Moderately	5	13.2	2	5.3		
	4	Quite a bit	4	10.5	3	7.9		
	5	Extremely	3	7.9	1	2.6		
Change in health	1	Much better	2	5.3	13	34.2	.471	<.001
	2	A little better	10	26.3	17	44.7		
	3	About the same	14	36.8	7	18.4		
	4	A little worse	9	23.7	1	2.6		
	5	Much worse	3	7.9	0	0.0		
Overall health	1	Excellent	8	21.1	14	36.8	.339	.043
	2	Very good	7	18.4	13	34.2		
	3	Good	12	31.6	8	21.1		
	4	Fair	7	18.4	3	7.9		
	5	Poor	4	10.5	0	0.0		

***Cont...* Table 1: Pre-Healing and Post Healing scores of COOP/ WONCA charts along with Sleep and Pain questionnaires.**

Sleep	1	Excellent	4	10.5	14	36.8	0.4	.006
	2	Very good	3	7.9	7	18.4		
	3	Good	12	31.6	6	15.8		
	4	Fair	9	23.7	9	23.7		
	5	Poor	10	26.3	2	5.3		
Pain	1	Not at all	5	13.2	9	23.7	.463	<.001
	2	Slightly	2	5.3	15	39.5		
	3	Moderately	7	18.4	7	18.4		
	4	Quite a bit	10	26.3	4	10.5		
	5	Extremely	14	36.8	3	7.9		

f= frequency: CC=Contingency Coefficient: P= Significance

CONCLUSIONS

Pranic healing was found to significantly improve major domains of functional health, and wellbeing of jail inmates. This could assist jail inmates during their rehabilitation program. Further studies are needed to ascertain the effects of PH on female and adolescent inmates.

Conflict of Interests: All the authors reports no conflict of interests

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Ethical Clearance: Permission was obtained from Government of Karnataka, District AYUSH Body, Yadavagiri, Mysore to perform this study.

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Tea Ash - A New Medium for Water Defluoridation

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ABSTRACT

Background: Fluorosis being irreversible should be prevented by providing water with optimal fluoride concentration. Due to certain limitations of routinely used defluoridation methods, exploration of indigenous products for the prevention of fluorosis calls for. Hence the study was designed with an aim to compare the defluoridation efficacy of tea ash in water at various concentrations.

Materials & Method: Specifically treated tea residue was used. Fluoride level was measured using fluoride ion selective electrode at National Environmental Engineering Research Institute (NEERI), Nagpur, India. Testing samples of 2 different particle sizes were added in 50ml of water containing 4ppm of fluoride. The concentration of fluoride remaining in the filtrate was analyzed after 60 and 90 minutes and 24 hours. Following initial results, varying quantities of tea ash (105 µm) were added in 50ml of water containing fluoride of different concentrations. The concentration of fluoride remaining in the filtrate was analyzed after 30 and 60 minutes.

Results: Tea ash exhibited defluoridation capacity at both particle sizes. Tea ash (105µm) weighing 0.5, 0.75, 1, 1.25, 1.5 gm was found to be effective to reduce water fluoride content from 2, 3, 4, 5, 6 ppm to an almost optimum fluoride concentration.

Conclusion: Tea ash can be advocated as an efficient, cost-effective domestic defluoridating agent.

Keywords: *Adsorption, Defluoridation, Fluoride, Tea ash, Water*

INTRODUCTION

Access to safe drinking-water is a basic human right; however contaminated drinking water is proving to be the most dreaded menace to human life[1]. Water quality may be compromised by various contaminants of which fluoride stands first as a pollutant of geogenic origin in many countries[2]. Fluoride concentration in water is directly proportional to dental fluorosis and inversely to dental caries[3]. Geographical belt of high fluoride content in groundwater extends throughout the world which has resulted in endemic fluorosis in most of the regions of the world. Around 100 million people worldwide are thought to have been suffering from fluorosis[4]. Other than water sources, fluoride is delivered through diet, dentifrices and other sources[5].

Prevention through defluoridation of contaminated water is the only solution for fluorosis since it has no cure. Routine defluoridation techniques like reverse osmosis, Nalgonda technique, activated alumina process, etc are widely used for supplying safe water to the fluorosis affected communities but with certain limitations[2]. Hence, exploration of alternate safe approach of potential utility such as use of naturally available low cost defluoridating agents becomes necessary[2]. But literature regarding their use as bioadsorbent is sparse. Hence the present study incorporated tea ash, since large amount of tea is consumed and large amount of tea residue is wasted daily throughout the world[6]. Hence, efforts need to be made in the direction of rightfully using the daily wastes of indigenous origin for the purpose of health benefit. The present study was designed with an aim to

investigate defluoridation efficacy of tea ash on different concentrations of fluoride in water.

MATERIAL AND METHOD

The present study is an in-vitro study conducted at the Water Technology and Management Division (WTMD), National Environmental Engineering Research Institute (NEERI), Nagpur. Prior to the initiation of the study, approval of the intended study was obtained from the Head Scientist, WTMD, NEERI, Nagpur.

Preparation of Tea Ash:

The tea residue (Residue left on the sieve after preparation of drinking tea) was collected from nearest teashop in local market. Soluble and coloured components were removed from tea by washing with boiling water. This was repeated until the water was virtually colourless. After thoroughly washing, the adsorbent was sun dried and it was burnt in muffle furnace at 500 ºC for 30 minutes and dried tea ash was sieved to get particles of sizes 105 µm & 210 µm and stored in sealed polythene bags. This is termed as the activated Tea ash powder[7].

Analytical Procedures:

All the analytical procedures were carried out at WTMD, NEERI, Nagpur using calibrated instruments. A standard solution of 1000 ppm fluoride was prepared by dissolving 2.21 g of sodium fluoride (NaF) (Merck Specialities Private Limited) in 1000 ml of double distilled water and stored in polythene bottles (PolyLab). The fluoride solution of required concentration was prepared by diluting this standard solution. Fluoride in all solutions was measured by using fluoride ion selective electrode (Thermo Scientific Orion 9609BNWP Ion plus Sure-Flow Fluoride) and monitored on Orion Star A214 (ISE meter). The weighing of bioadsorbents and reagents used was done using calibrated digital analytical balance.

The batch experiments were carried out in 125 mL stoppered bottles (PolyLab) by agitating a pre-weighed amount of the adsorbent in an orbital shaker at 110 rpm with 50 mL of the fluoride solutions of required concentrations. pH of all solutions was maintained at 5 to 7. The adsorbent was separated with Whatman's filter paper. The concentration of fluoride remaining in the filtrate was analyzed.

The first stage of the experiment was aimed at assessing the presence or absence of defluoridation capacity of the tea ash in two different particle sizes on the fluoride level of synthetically prepared water containing 4 ppm of fluoride. The analysis was then done to check for presence or absence of defluoridation, time required for defluoridation if present, and physical properties like pH, turbidity and hardness of water. The second stage of the experiment was aimed at checking the defluoridation efficacy of the products found effective in the first stage, using various pre-weighed amounts of bio-adsorbents at varying fluoride concentrations.

Stage I:

The stock solution was diluted to prepare water containing 4 ppm of Fluoride. Turbidity and total hardness of this water before the addition of biosorbents was measured. It was found to be zero. pH was measured using waterproof pH testr30 (Eutech Instruments); Turbidity was measured using Turbidimeter TN 100 (Eutech Instruments); Total hardness was measured using EDTA Titration Method[8].

50 ml of this water was taken in each of the 2 stoppered bottles. 1gm of each of processed tea ash samples of different particle sizes (105 & 210 µm) was added in each of the bottles. The solutions were manually stirred followed by placing them in an orbital shaker (REMI RS-24BL) at 110 rpm. The adsorbent was then separated using Whatman's filter paper. The concentration of fluoride remaining in the filtrate was analysed in each of the 2 bottles after 60 minutes, 90 minutes and 24 hours. The final turbidity, total hardness and pH were also measured. All the batch experiments were repeated thrice to check for the repeatability.

Stage II:

Since the first stage inferred that 105 µm particles showed more defluoridation, the second stage was conducted to check the efficacy of tea ash particles of 105 µm as a defluoridating agent. Varying pre-weighed amounts of 105 µm tea ash i.e. 0.5, 0.75, 1, 1.25, 1.5 gms was added in 50 ml of each of synthetically prepared Fluoride Water containing 2, 3, 4, 5, 6 ppm of Fluoride in 125 ml stoppered bottles. They were kept in orbital shaker at 110 rpm. The adsorbent was separated with Whatman's filter paper. The concentration of fluoride remaining in the filtrate was analyzed after 30 minutes and 60 minutes.

Statistical Analysis:

The data obtained was compiled, tabulated and sent for statistical analysis and graphical representation. Data was analyzed for descriptive statistics using Statistical Package for Social Sciences Version 16. Regression analysis was applied to assess the effect of different quantities of tea ash on varying concentrations of fluoride level in water.

RESULTS

The first stage of the study showed that out of the two particle sizes used for tea ash, 105 µm showed greater defluoridation efficacy than 210 µm. Turbidity, hardness and pH showed increase in both particle sizes of tea ash **(Table 1).**

Based on the results of first stage, only tea ash of particle size 105 µm was used in the second stage in varying amounts and in varying concentrations of fluoridated water. In all of them, tea ash was observed to reduce the fluoride content **(Table 2).**

Table 3 shows association of tea ash with change in fluoride level in water. With gradual increase in the quantity of tea ash used, there in gradual decrease in fluoride level of treated water both after 30 minutes as well as 60 minutes. Maximum fluoride reduction was seen when 1.5 gms of tea ash was used in 6 ppm initial fluoride concentration water after both 30 as well as 60 minutes.

DISCUSSION

Fluoride is known to be a natural contaminant for ground water resources globally. Routine defluoridation techniques, being expensive and technique-sensitive[9], it is best to avail indigenous defluoridating agents for water which can be used by the masses at domestic levels. Thus, the idea of the present study was conceived as a result of the need of domestic defluoridating agents for decreasing the prevalence of fluorosis by a cost-effective intervention. A wide variety of biosorbents have been studied in the past, but they have not given reproducible results and their comparative efficacy is not yet known. Hence, the present study aimed to check the presence of defluoridaton capacity of tea ash using different particle sizes.

The present study confirmed defluoridation potential of tea ash. This is in accordance with the study conducted by Mondal et al[7]. Study concluded that waste tea ash has fluoride removal capacity. According to this study, elemental analysis of tea ash showed that it contained 58.33% Carbon which may act as an adsorbent for fluoride. This is the activated carbon present in the processed tea ash. Activated carbon is a form of carbon accompanied with small, low-volume pores that increase the surface area available for adsorption and chemical reactions. Due to its higher degree of micro porosity, only 1 gram of activated carbon has a surface area in surplus of 500 m^2. An activation level sufficient for helpful application may be attained solely from high surface area[10]. This is in accordance with studies conducted by Kumar S[11] and Emmanuel KA[12].

Particle size plays an important role in adsorption. Adsorption depends greatly upon the surface area available[13]. In the present study, the effect of two different particle size (105 µ & 210 µ) of adsorbent on defluoridation capacity was evaluated at different time intervals. Increasing the particle size from 105 µ to 210 µ reduced defluoridation capacity of tea ash samples at every time interval **(Table 1).** It may be due to the fact that smaller particle size of adsorbent gives large surface area and thus, increases the adsorption capacity[14]. The present study also evaluated the effect of adsorbent dose on fluoride level in water as different initial fluoride concentrations (2 ppm, 3 ppm, 4 ppm, 5 ppm & 6 ppm). Increase in the quantity of tea ash from 0.50 gms to 1.5 gms led to increase in reduction in fluoride level in water at both the time intervals (30 & 60 minutes). Initial fluoride concentration of 6 ppm showed maximum reduction in fluoride level after 30 as well as 60 minutes for each quantity of tea ash evaluated. This might be attributed to increase in adsorption sites due to increase in the quantity of bio-adsorbent[15,16].

pH changes were also noticed in water with the use of tea ash. The pH of fluoride-containing water before the addition of tea ash was maintained neutral (pH 7). With the addition of tea ash, it increased upto 8.3-8.4 which is within acceptable limits[17]. Hardness of treated water also showed rise within acceptable limits; while turbidity increased beyond permissible limits[17]. Turbidity of water can be removed by simple method using natural coagulants or by letting the water sit for few hours so that particulate matter settles down at the bottom and decanting the clean water in another container[18,19]. The present study did not evaluate the other qualitative parameters of water like taste and odour

due to time constraints.

Table 1: Changes in level of fluoride, turbidity, hardness and pH of water using the two particle sizes of tea ash

Particle size	Mean Fluoride Reduction after 60 minutes	Mean Fluoride Reduction after 90 minutes	Mean Fluoride Reduction after 24 hrs	Turbidity after addition of biosorbent	Hardness after addition of biosorbent	pH after addition of biosorbent
105 µ	2.04±0.055	3.04±0.055	3.63±0.008	102.5±2.1	200	8.30±0.10
210 µ	1.49±0.114	1.86±0.055	2.64±0.055	99.2±1.0	212	8.32±0.04

Table 2: Mean change in fluoride level using varying quantities of tea ash of particle size 105 µm in water of varying fluoride concentrations

Initial Fluoride concentration	Time Interval	Tea Ash Quantity used for Defluoridation									
		0.5gm		0.75gm		1 gm		1.25 gm		1.5 gm	
		Mean (ppmF)	S.D.	Mean (ppmF)	S.D.	Mean (ppmF)	S.D.	Mean (ppmF)	S.D.	Mean (ppmF)	S.D.
2 ppm	After 30 minutes	0.75	0.023	0.67	0.109	0.67	0.016	0.66	0.013	0.64	0.040
	After 60 minutes	0.53	0.048	0.50	0.230	0.46	0.033	0.44	0.008	0.37	0.000
3 ppm	After 30 minutes	1.38	0.109	1.20	0.158	1.10	0.070	1.08	0.044	1.04	0.054
	After 60 minutes	0.85	0.032	0.83	0.026	0.81	0.016	0.76	0.026	0.58	0.000
4 ppm	After 30 minutes	1.96	0.114	1.76	0.114	1.64	0.054	1.62	0.044	1.56	0.114
	After 60 minutes	1.34	0.089	1.33	0.042	1.06	0.062	1.02	0.044	0.82	0.000
5 ppm	After 30 minutes	2.56	0.547	2.40	0.158	2.22	0.044	2.08	0.044	2.06	0.054
	After 60 minutes	1.90	0.100	1.86	0.037	1.78	0.032	1.24	0.028	1.1	0.000
6 ppm	After 30 minutes	3.10	0.070	3.00	0.100	2.92	0.044	2.76	0.089	2.73	0.120
	After 60 minutes	2.51	0.56	2.50	0.063	2.33	0.033	2.24	0.014	1.42	0.115

Table 3: Association of tea ash with change in fluoride level in water

Initial Fluoride concentration	Final Fluoride Concentration	β (Standard Error)	t value	p value
2 ppm	After 30 minutes	-0.086 (0.017)	-4.989	0.001
	After 60 minutes	-0.149 (0.016)	-9.214	0.001
3 ppm	After 30 minutes	-0.320 (0.058)	-5.538	0.001
	After 60 minutes	-0.248 (0.029)	-8.611	0.001

***Cont...* Table 3: Association of tea ash with change in fluoride level in water**

4 ppm	After 30 minutes	-0.376 (0.057)	-6.553	0.001
	After 60 minutes	-0.540 (0.042)	-12.748	0.001
5 ppm	After 30 minutes	-0.528 (0.051)	-10.368	0.001
	After 60 minutes	-0.887 (0.077)	-11.478	0.001
6 ppm	After 30 minutes	-0.392 (0.049)	-8.009	0.001
	After 60 minutes	-0.971 (0.128)	-7.565	0.001

CONCLUSION

The present study concludes that tea ash can be used as an efficient and cost-effective domestic defluoridating agent, provided measures are taken to overcome its limitations like increase in water hardness and turbidity. Also, its odour and taste need to be tested for. Thus, the large amounts of tea residue wasted at both domestic and other levels can be re-used for health benefit.

Ethical Clearance: Taken from Institutional Review Board of ACPM Dental College, Dhule.

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Developing a Framework for Emotional Intelligence (EI) based Functions in a Small Organisation

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ABSTRACT

Introduction: It is well established that effectiveness of any organization is driven & determined by effectiveness of its core HR functions like recruitment, teamwork, talent retention, employee morale , employee engagement . Emotional Intelligence significantly influence these key HR function and hence is a major driver of organizational effectiveness. The paper tries to recommend methods to institutionalize EI in a small organization.

Purpose: The paper explore to prepare a model framework for EI based functions in organization. Integration of EI into the processes and functions of companies is in the interest of both organization and individual. EI in an organization can be developed to cater to career based EI competency requirement of individuals for higher organizational effectiveness.

Material & Method: The study has taken into cognizance earlier theories available in the field and has suggested a small Questionnaire for administration on Likert scale developed a which can be analysed and be used for introduction of EI based HR functions.

Findings & Implications: The paper reinforces the high importance of EI in organization and its relevance with critical HR based function in small organization. Implication of the paper is to facilitate small organization to develop their own model framework for integrating EI into critical HR functions so as to enhance ability of employee to improve interpersonal relationships for higher organizational effectiveness

Keywords: *Emotional Intelligence, job performance, EI competency, Employee coaching.*

INTRODUCTION

Emotional Intelligence (henceforth referred to as EI) is a social intelligence which can be defined as one's ability to be aware & monitor his own as well as emotion of others so as to differentiate them and utilize such information for thinking and decision .

According to Daniel Goleman, a pioneer in the field of EI, it is composed of five inter-related and crucial elements. They are

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- Self-awareness
- Self-regulation
- Motivation
- Empathy
- Social Skills[1]

EI can be defined as the ability to (Fatt, 2002):

- Accurately perceive, evaluate and express emotion - Perception, evaluation and expression of emotion involve the ability of individuals to correctly identify emotions and emotional content. Maturity of an individual is the ability to monitor internal feelings and recognize not only his/her own feelings but also that of others.

- To understand how well emotion can facilitate thought and intellectual processing and generate the correct emotion . The ability to anticipate how one will feel can facilitate the decision making process while an individual to ventures into new territories,

- The competence to evaluate emotions and utilize emotional knowledge. It will help in recognizing & acknowledging presence of different contradictory emotions with varying level of depth & complexity as well as their influence on thought & action .

- For development of emotional & intellectual growth through conscious regulation of emotions , engagement and disengagement from emotions appropriately, managing emotions to enhance the positive emotions and reduce negative ones.[2]

Job performance & Emotional Intelligence:

Main reasons for which EI is increasingly being considered as important in the workplace are :

- For Outstanding performance in every field as per research , EI is twice as important as cognitive abilities. 90% of success is attributable to EI for success at high levels.

- In a competitive environment , it is important to have a balance between rational and emotional aspects for any strategy involving organization & employee to have a competitive advantage .

- IQ alone is not the determining factor to account for the different level of success of individuals in any organizational .

Effectiveness of managers as indicated in many studies is influenced by true understanding of their own and other's emotions, and ability to use that understanding to effectively engage with people . Managers who don't understand emotions at workplace are comparatively less effective.[3]

EI helps in performance and provides career advancement opportunities in organizations. (Dulewicz & Higgs, 2003). According to Cherniss (1997), remarkable empathy is shown by leaders having high EI and they make others feel understood, empowered, rewarded

Supported and trusted.[4]

Researchers also suggests that behavior of emotionally competent people is rational and emotionally balanced since they possess competencies which can be classified into two broad categories (Mayer, Goleman, Barrett, & Gutstein, 2004) (Salovey, Bedell, Detweiler, & Myer, 1999) :

- In simple terms, personal competence can be defined as understanding and managing one's own self. Emotional intelligence is based on the idea that one must first become aware of our emotions before one is able to alter one's behavior for better results. Studies show that managers who maintain a high level of self awareness posses more aspects of EQ and are therefore rated as more effective by both superiors and subordinates than those who are not self-aware. Knowledge about the nature of one's personality is vital to making sound decisions. In other words, its the ability to take a step back from the situation to become aware of what's happening rather than become immersed in it and lose control. Self-awareness is not getting carried away with emotions, but rather objectively identifying them in order to take control of the subsequent actions resulting from these emotions.[5]

People who have a high degree of self-awareness recognize how their feelings affect them, other people, and their job performance. Thus, a self aware person who knows that tight deadlines bring out the worst in them, plans their time carefully and gets their work done well in advance. Another person with high self awareness will be able to work with a demanding client.

- Social competence is the ability of a person to gain psychological insight into the others' emotion and to use the knowledge as well as interpersonal relationship skill to generate desirable behavioral outcomes both for themselves and for others.[6]

Objectives: Developing EI based functions in organization

Emotional intelligence is being seen as a strategy for organizational interests. Hess and Bacigalupo (2010), in the context of knowledge-based organizations, have stated that EI can be used as an organizational development initiative for imbibing the mission & vision of organization in employees throughout the organization, which gets extended to the customers resulting in enhanced service to the customers. [7]

According to Cherniss (Cherniss, Emotional Intelligence and Organizational Effectiveness, 2001), effectiveness of any organization is driven & determined by effectiveness of its core HR functions like recruitment , teamwork, talent retention , employee morale , employee engagement . Emotional Intelligence significantly influence these key HR function and hence is a major driver of organizational effectiveness.[8]

It also needs to be understood that a different set of Emotional Intelligence competencies are required for various jobs and services. A career-based requirement of EI competencies has been created by Book and Stein (2006). Some examples are presented below:

Nature of Work	EQ factors/ competencies
Accountants	Problem-Solving, Empathy, Social Responsibility
Business Managers.	Stress Management , Self-Actualization Optimism, Happiness, Self-Regard,
Corporate Trainers	Self-Regard, Interpersonal Relationships, Assertiveness, Self-Actualization, Happiness
Customer Service Representatives	Self-Actualization, Reality Testing, Optimism, Happiness, Interpersonal Relationships
Engineering and Related Technologies	Problem-Solving, Social Responsibility, Optimism, Self-Actualization, Empathy
Financial Management	Self-Actualization, Self-Regard, Stress Tolerance, Optimism, Independence
Homemakers	Problem-Solving, Stress Tolerance, Optimism, Emotional Self-Awareness, Self-Regard
Lawyers	Emotional Self-Awareness, Reality Testing, Assertiveness, Interpersonal Relationship, Stress Tolerance
Personnel and Human Resources Administrators	Empathy, Happiness, Optimism,
University Professors	Independence, Assertiveness, Problem-Solving, Flexibility, Self-Actualization [9]

EI is being inducted in many organizations. Employers are now taking up notice as various studies are time and again proving the comparing worth of EI in predicting business performance as against employee skills, knowledge and expertise. Growing realization of importance of EI in organizations can be observed by implementation of EI based initiatives lie use of emotional intelligence in performance reviews & management training in Avon, leadership development programme based on EI in Boeing, Kodak, FedEx , BMW and impact of EI training in increase of sales performance of managers in pharmaceutical company Sanofi-Aventis are indicative .[10]

As the above examples demonstrate, EI has been proved to be a performance booster in various firms. It also positively impacts upon the work environment, resulting in better organizational results, lower employee turnover and various related aspects.

Therefore, such examples present a strong case for the integration of EI into the processes and functions of companies. In order to develop EI at workplace, it is imperative to have an preliminary assessment of perception of employees regarding Emotional Intelligence and its Correlation With Job competence & Performance.

METHOD

Employee perception study

In order to study the perception of employees with regard to concept of emotional intelligence & its correlation, a survey amongst employees may be done after formulating a questionnaire. The sample may be based on random sampling or stratified sampling depending upon the job categorization or level of employees. The response may be sought on a five point likert scale with the following indicators.

1- Strongly Disagree

2- Disagree

3- Neutral

4- Agree

5- Strongly Agree

The questionnaire may be divided into three segments pertaining to various aspects relating to the organization , EI and performance. However, the questions can be put in a random manner basically to cover two parts i.e. Correlation of EI with various factors and indicators and Elements of EI and Performance in context of specific organization as well as job functionalities .

Some of the sample critical questions seeking responses which may be included in the Questionnaire are given below:

- EI is a major determinant of the performance of the employees.
- Managerial EI is positively related to profit performance.
- For career advancement & elevation in senior & middle level managerial positions , EI should be a far more important criterion than managerial skills & intellect .
- The weightage of EI related elements in the performance appraisal system should be increased.
- EI should be more closely integrated in the performance management system
- EI should be more closely integrated into the recruitment system of organization
- EI is one of the most crucial elements in the path to organizational development.
- Organisation should start formal training programs for EI.

Analysis of Findings & Implementation :

Analysis may be made on perception of employee regarding EI impacting performance (such as interpersonal relationships, stress tolerance levels, optimism, empathy, self-regard, assertiveness impact performance at workplace) based on the response .

In the workplace to inculcate EI into the employees, a five stage model for developing EI (or Social and Emotional Learning, abbreviated as SEL) by Cherniss and Goleman (2001) can be adopted . Pre-contemplation, Contemplation, Preparation, Action and Maintenance are the main stages indicated in the model.[8]

Developing a conducive environment encouraging and supporting the process of change is a primary requirement which must be ensured by the organization to make the model implementable . The next important stage is to assess the change preparedness and readiness of the learners . In case the employees are already motivated , they would be able set goal for themselves without external interventions . If the level of change preparedness is not at desirable level , efforts has to be made through organizational interventions to motivate them for inducing the desired change .

This desired motivation can be induced by:

- Facilitate Learners to recognize advantage of EI
- Giving feedback & facilitate Learners to evaluate their competence both Emotional and Social
- Self learning
- Help imbibing a sense of optimistic Expectations to Succeed

In the preparation phase, goal Setting is one of the primary activity. Goals must be manageable, measurable, specific & time bound. Various researchers have suggested that making the goal public or putting it in writing can enhance the motivation.[11]

The next task is to use models of desired skills that the individuals are comfortable with. A crucial factor here is that simple workshops of a few days may not work in the long run. It is necessary that the momentum is sustained. The sustained effort may stretch over a significant period of time and may require regular practice of the acquired behavior by the learners. Repetition of the behaviour in diverse situational context is crucial for success of SEL in any organization.

DISCUSSION

After the individual has learned and picked up the skills, it is necessary to be applied to the work environment. However, in various scenarios things may not go accordingly and the individual might have

to encounter a setback and may doubt the necessity and usability of the learned skills. In this situation , making the learners mentally prepared in advance for such setback is very effective to deal with the problem . Various technique for preventing such setback is available like relapse prevention, which helps learners to anticipate setback and to prepare effective ways to counter the setback so that the relapse doesn't occur and is prevented.

It is also paramount that follow up support is available to the individuals even after the solutions for setbacks. A large part of this is organizational support. In order to help the learners to maintain their pattern of thoughts and actions, which they have newly acquired through SEL , methods like stimulus control & contingency management are quite effective.

In stimulus control, learners provide cues themselves or are provided externally by others so as to induce desired response . The environment is accordingly revamped to increase such cues which can induce the desired bevabiour. In Contingency management technique , the learners are given reward to encourage use of new skills and are given punishment for discouraging display of undesired behavior . The reward works as a positive reinforcement for the new skill where as the punishment has negative reinforcement effect on learners not using new skill. Another important element is coaching which can enhance performance through designed and structured interactions .[12]

CONCLUSION

For a conducive work environment and high levels of employee motivation, EI based HR functions is imperative and is a good strategy to induce a performance oriented environment.

The paper has reinforced the high importance of EI in organization and its relevance with critical HR based function in small organization . Through analysis of response of employee perception study on EI as well as five stage implementation model , a small organization can develop its own model framework for integrating EI into critical HR functions so as to enhance ability of employees for higher organizational effectiveness & competitive advantage .

Conflict of Interest : There is no financial or other substantive conflict of interest which may influence the results or interpretation of the paper.

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Ethical Clearance : The procedures followed are in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) .

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Knowledge, Attitudes and Practices Towards HIV/AIDS in General Population Covered by Urban Health Training Centre, Hapur

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Introduction: Inadequate Knowledge and risky practices are major cause of spread of HIV/AIDS.

Material and Method: This study aimed to assess knowledge attitude and practices about HIV/AIDS among respondents of registered field practices area of Urban Health Training Centre, Hapur .The interview technique was adopted to carry out the study, by door to door survey among 200 registered families above the age of 17 years. The aim of the questionnaire was to obtain information on the level of HIV/AIDS related KAPs of the respondents, as well as their sources of information on this issue.

Results: Maximum response was from age group of 17- 28 Yrs (49.0%) followed by 29 -40 Yrs (30.0%).57% respondents were Male & 48% were female. Majority of respondents were Hindu (87%) followed by Muslim (12%), Christian & Sikh accounts for 1% only. Majority of respondents were unmarried 54%. 58% respondents said that HIV infection damage the immunity power of body & 26% of the respondent said that AIDS is primary stage of HIV infection. 57% of the respondents were aware that keeping unsafe sexual relationship with one or more partner would cause HIV/AIDS infection. 54% respondents were aware that the immunity of body gets destroyed after entry of HIV virus in human body. Majority of 67% respondents said that HIV/AIDS is not a communicable disease. 46.5% respondents have knowledge on general symptom of AIDS. Almost 50% of the respondents said that vaccine is not available for prevention of HIV/AIDS. Almost 35% of the respondents said that the baby does not get HIV/AIDS infection from mother. Majority of the respondents 53% felt comfortable for being tested at District hospital.

Conclusion: Understanding KAP among general population help us to formulate hypothesis for prevention and control of AIDS.

Keywords: *Attitude, Practices, HIV/AIDS*

INTRODUCTION

HIV/AIDS epidemic has emerged as one of the most serious and enormous health problems in about two decades in India. [1] The mode of transmission of HIV/AIDS is known and is largely preventable, but due to lack of knowledge and practices about HIV/AIDS in general population makes it rapid spread in our country. Widespread ignorance, poor information and misconceptions about the disease in the society are responsible to cause in social stigma and discrimination and stigmatization. In 2015, HIV prevalence in India was an estimated 0.26%.[2] This figure is small compared to most other middle-income countries but because of India's huge population (1.2 billion) this equates to 2.1 million people living with HIV. In the same year, an estimated 68,000 people died from AIDS-related illnesses.[3] Understanding about the knowledge, attitude and practices about HIV/AIDS of people having HIV/AIDS (source of infection), care givers(including patient attendant and medical staff) and in general populations will help us in formulating strategy for prevention, treatment and improving compliance to treatment of HIV/AIDS.

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HIV/AIDS patients are source of infection and they must know about various modes of transmission of HIV and ways of protection against it. So, in this study we plan to assess and compare the knowledge, attitude and practices about HIV in general population.

OBJECTIVES

i. To know the socio-demographic pattern of respondents.

ii. To study the knowledge, attitude and practices about HIV/AIDS among respondents.

iii. To know the knowledge for prevention of HIV/AIDS

iv. To study the social stigma and discrimination attached with disease.

MATERIAL AND METHOD

The study was carried out in the urban field practice area of UHTC, Sarswathi Institute of Medical Sciences, Hapur from July 2011 to Jan 2012 after taking permission from ethical committee. The interview technique was adopted to carry out the study, by door to door survey among 200 registered families using random sampling. Duly performed questionnaire was filled with the help of individual member of the families. The Respondents were people above the age of 17 years.

The respondents were informed about the purpose of the study and were assured that their responses would be treated confidentially. Respondents were also informed that their participation was entirely voluntary and that they were free to decline to answer any question that made them feel uncomfortable. The aim of the questionnaire was to obtain information on the level of HIV/AIDS-related KAPs of the respondents, as well as their sources of information on the issue .The questionnaire developed by the global school-based health survey for South Asian countries and Family Health International's questionnaire on HIV/AIDS prevention in developing countries were also reviewed during the questionnaire development [4] [5]. Our final questionnaire included questions relating to HIV knowledge, attitudes and sexual practices, in addition to socio-demographic information. The questionnaire focused on the socio-demographic characteristics of the respondents, including age, residence, religion and their sources of information about HIV/AIDS. It also contained knowledge-related items, questions relating to transmission, and prevention and control of HIV/AIDS. We included both positively and negatively framed questions to assess their knowledge, as well as their misperceptions, about HIV/AIDS. Finally, questions were asked about practices related to HIV/AIDS, including sexual behavior and daily activities. Before data collection began, the questionnaire was piloted with 10 respondents, testing for clarity, feasibility and appropriateness. Descriptive statistics were used to describe demographic characteristics and KAPs about HIV/AIDS. Numbers and percentages were used to present data.

Observation: Out of total 200 respondents following observation were made -

Table No.1 Age-wise distribution of Respondents.

Age group	Frequency (No.)	Percentage (%)
17-28	98	49.0
29-40	60	30.0
41-52	36	18.0
>53	6	3.0
Total	**200**	**100**

Maximum response was from age group of 17-28 Yrs (49.0%) followed by 29 -40 Yrs (30.0%) and minimum response was from age group of more than 53 Yrs (3.0 %).

Table No. 2 – Sex- wise distribution of participants

Sex	Frequency (No.)	Percent (%)
Male	114	57
Female	86	43
Total	**200**	**100**

Out of total 200 respondents 57% were Male & 48% were female.

Table 3. Distribution of respondents according to their socio-demographic profile.

Socio-demographic profile of the participants	Frequency (No.)	Percentage (%)
Religion		
Hindu	174	87.0
Muslim	24	12.0
Christian	1	0.5
Sikh	1	0.5
Caste		
General	143	71.0
OBC	32	16.0
SC/ST	25	13.0
Marital status		
Married	93	46.5
Unmarried	107	53.5
Education		
Primary	24	12.0
High School	47	23.5
Inter	40	20.0
UG	41	21.0
PG	28	14.0
Professional	20	10.5
Occupation		
Agriculture	46	23.0
Service	119	59.5
Business	35	17.5

Majority of respondents were Hindu (87%) followed by Muslim (12%), Christian & Sikh accounts for 1% only. Majority of respondents were unmarried (54%) as compared to married respondents (46%).

Majority of respondents were from general category (71%), where as 16% OBC & 13% belonged to SC/ST Category.Majority of the respondents had completed under graduation i.e 21% though 14% population had persued post graduation .Almost 60% respondents were occupied with service class where as 23% & 18% were doing agriculture and business respectively.

Table 4. KAPs of respondents towards HIV/ AIDS

Parameters	Number	%
What is AIDS?		
Primary stage of HIV infection	52	26.0
Name of a medicine	32	16.0
Completely damage the immunity power in body	116	58.0
Awareness about effect of HIV on human body.		
Cell increase	27	13.5
cell destroys	40	20.0
Cell Decrease	25	12.5
Destroys the Immunity	108	54.0
Source of information about HIV/AIDS		
TV & Radio	70	35.0
Hospital or Doctor	40	20.0
Family Member or Relative	18	9.0
Any Acquaintance or Friends	30	15.0
News paper & Magazine	42	21.0
Awareness about spread of HIV/AIDS		
Live & meet each other	34	17.0
Sit & eat together	20	10.0
Look after HIV patients	32	16.0
Unsafe sex relation with one /more partner	114	57.0
Knowledge about General symptoms of HIV/AIDS		
Recurrent infections	23	11.5
Loss of appetite	32	16.0
Weight lose up to 10% & more	52	26.0
All above	93	46.5
Knowledge about spread of HIV/AIDS by mother's milk		
Yes	78	39.0
No	70	35.0
Don't Know	52	26.0
Knowledge about treatment of HIV/AIDS		
Take medicine regularly	116	58.0
Not necessary to take medicine	30	15.0
Compulsory rest a lot	54	27.0
Knowledge about Communicability of HIV/AIDS		
Yes	54	27.0
No	133	66.5
Don't Know	13	6.5
Transmission of HIV/AIDS During pregnancy		
Yes	114	57.0
No	41	20.5
Don't Know	45	22.5
Knowledge about vaccination for HIV/AIDS.		
Yes	69	34.5
No	99	49.5
Don't Know	32	16
Knowledge about Window Period of HIV		
Immediately	35	17.5
After few months	108	54
After three months	57	28.5
Information on prevention of HIV/AIDS		
Don't keep sexual relation with more than one person	45	22.5
Always use new sterilized needle for injection	29	14.5
Test the blood for HIV/AIDS before blood transfusion	29	14.5
All above	97	48.5
Preference for testing of HIV/AIDS		
Any Private Hospital	56	28.0
Any clinic	39	19.5
District Hospital or Government Medical College	105	52.5
General conception about treatment		
Take medicine regularly	116	58.0
Not necessary to take medicine	30	15.0
Compulsory rest a lot	54	27.0
Discrimination of HIV positive people		
Yes	90	45.0
No	75	37.5
Don't know	35	17.5

58% respondents said that HIV infection damage the immunity power of body & 26% of the respondent said that AIDS is primary stage of HIV infection. Majority 54% respondents were aware that the immunity of body gets destroyed after entry of HIV virus in human body. 57% of the respondents were aware that keeping unsafe sexual relationship with one or more partner would cause HIV/AIDS infection. 17% respondents have the opinion that living together would cause HIV/AIDS& 10% & 16% respondents told that respectively looking after HIV patients or eating/sitting together would cause HIV/AIDS.

57% of the respondents were aware that keeping unsafe sexual relationship with one or more partner would cause HIV/AIDS infection. 17% respondents have the opinion that living together would cause HIV/AIDS & 10% & 16% respondents told that respectively looking after HIV patients or eating/sitting together would cause HIV/AIDS.58% respondents felt that medicine should be taken regularly after diagnosis of HIV/AIDS.

Majority of 67% respondents said that HIV/AIDS is not a communicable disease whereas only 27% respondents said that HIV/AIDS is a communicable disease. Almost 35% of the respondents said that the baby does not get HIV/AIDS infection from mother. 23% of respondents were not sure that HIV can pass from mother to her baby & 57% of respondents were aware of transmission of HIV from mother to her baby.

29% the subjects responded that the symptoms starts appearing after 3 months of contracting HIV.Almost 50% of the respondents said that vaccine is not available for prevention of HIV/AIDS. Almost 35% of the respondents said that the baby does not get HIV/AIDS infection from mother.

29% the subjects responded that the symptoms starts appearing after 3 months of contracting HIV.

For prevention of HIV/AIDS infection, 49% respondents said that one should not keep sexual relationship with more than one person & be faithful partner, and always use new/boiled syringe or needle for any injections , blood should be tested for HIV/AIDS before transfusion.

47% respondents felt that HIV/AIDS patients have cough/cold & loss of appetite & loss of weight upto10% or more.

Majority of the respondents (53%) felt comfortable for being tested at District hospitals /government medical colleges where as 28% & 19% respondents said that test for HIV/AIDS should be done at Pvt. Hospital & clinic respectively. 58% respondents felt that medicine should be taken regularly after diagnosis of HIV/AIDS.

DISCUSSION

The HIV/AIDS is acquired due to high risk behavior of people which helps the virus to enter the body. The major issue related to HIV/AIDS is social stigma and discrimination which exist at individual, family and societal level. Stigma and discrimination are main cause of the HIV /AIDS epidemic. The reasons behind these issue are wide spread ignorance, poor information and misconceptions about HIV /AIDS. Understanding about the knowledge, attitude and practices about HIV/AIDS of people having HIV/AIDS (source of infection), care givers (including patient attendant and medical staff) and in general populations will help us in formulating strategy for prevention, treatment and improving compliance to treatment of HIV/AIDS. In the absence of any preventive vaccine or curative treatment to this dread disease till date, prevention remains the only measure to apprehend the transmission of disease. Access and information about HIV are different from country to country. Some of the respondents can correctly answer basic questions regarding HIV and its transmission.

In this study 57% respondents were Male. In age wise categorization maximum number of respondents (49.0%) belongs to young age 17-28 years because this group is sexually active and their mind is very receptive .The present study indicate that respondents harbor misconception about HIV/AIDS communicability (57%)and symptoms (26%) etc. Almost similar misconception about HIV and its communicability is by study Cohall A et.al [6]

According to the present study Electronic media (TV, radio) was the main source of information in general population i.e35%.This finding is similar to Report of NFHS-II ,1998-99[7] Giri P,[8]Singh et al,2002[9]

Almost all respondents knew about HIV/AIDS and could correctly answer questions on HIV transmission and prevention, which indicates that respondents had a good basic awareness of the issue. Respondents also

did moderately well in answering questions relating to the main routes of HIV transmission. Similar findings have also been reported in studies done in Afghanistan, Kazakhstan, Pakistan and China. [10][11][12][13]

Most of respondents were agreed that HIV/AIDS can be prevented 48.5%.Similar finding was observed by L P Meena et al. [14]Knowledge about the modes of transmission was also less in general population in this study, results are comparable with the BSS (2001).[15]

Knowledge about transmission of infection from mother to child was 39.0% in general populations. Most of the respondents(22.5%) were aware that how one can prevent from being infected by HIV/AIDS like avoid unsafe sex, avoid untested blood transfusion (14.5%)and use of disposable syringe (14.5%).These data are little bit similar to to BSS (2001)[15], Kumar et al, (1999)[16] records.

Low level of awareness about preventive measures in our study was due to good number of study population not give the correct answer due to their poor literacy status.

In the present study, it has been observed that only 45.0% respondents felt discrimination. Because HIV patients were probably explained the high level of discrimination in our society. Similarly a study in Uganda, Mc Grath et al,1993[17], felt the fear of rejection and stigmatization in people living with HIV/AIDS to disclose their sero-status to family members.

Limitation of study- There were several limitations to the study. First, we restricted this study to only registered area and did not include out-of-area .Many people have adequate knowledge about HIV but do not act on it due to a wide variety of social, cultural and economic constraints.

CONCLUSION

In conclusion the survey among field practice area shows moderate KAPs about HIV/AIDS .This study highlighted some misconceptions about HIV transmission, stigma which needs to be addressed. Following recommendation is made like special IEC activities to educate general population, safe sexual practices and avoid risky behavior should be done. Mass media should be utilized in a big way to alleviate the misconception associated with HIV/AIDS within general population.

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The Role of Midwife through Antenatal Class Pregnancy for Improvement Delivery Assistance with Professional Health Workers

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ABSTRACT

One of the major public health problem in Indonesia is the high of maternal mortality rate (MMR). Based on data, the number of maternal mortality in Balangan in 2014 there were 294.3/100,000 live births. One of the efforts to decrease MMR through antenatal class pregnancy, right election for the delivery assistance and optimize the program through the role of midwife. This study used qualitative method. Population is the midwife in the working area of Health Office Balangan District and informant is 13 midwife coordinator. The research instrument is indepth interviews guide. Data were analyzed qualitative (interview transcript). The results showed the implementation of the antenatal class pregnancy in Balangan walking routinly within the guidelines of the antenatal class pregnancy through the role of midwifes in performing their duties, although still found a lack of initiative to moving the antenatal class pregnancy creatively to attract participants. Midwife as the spearhead of the antenatal class pregnancy program implementation class stated that there are several obstacles, among others, uneven funding, which is not ideal infrastructure in accordance with the guidelines, and there are still pregnant women who are illiterate thus hindering the process of providing information. The impact of this program implementation is an increase in birth attendance by skilled health worker. Therefore, it can be concluded that the midwife's role in the implementation of a the class of pregnant women in Balangan is good enough although they encountered some problems and may increase the scope of delivery assistance by professional health worker . Required all of sector cooperation and sustainable and that further study about mother health and mortality for decrease MMR.

Keyword: *role of midwife, delivery assistance, antenatal class pregnancy*

INTRODUCTION

One of the major public health problem in Indonesia is the high rate of maternal mortality related to pregnancy and childbirth. Maternal mortality is a phenomenon tip of the iceberg because the case quite a lot but that appears on the surface only a small part. World Health Organization (WHO) estimates that there are 500,000 maternal deaths each year, 99% of which occur in developing countries. Maternal Mortality Rate (MMR) in Indonesia is 208/100,000 live births[1]. Maternal Health Problems also be a problem in South Kalimantan province, especially in Balangan District. Based on data from the Provincial Health Office of South Kalimantan, that a rise in cases of the year 2013 as many as 105 cases to 120 cases in 2014. According to data on the number of maternal deaths in Balangan, in 2014 there were 294.3/100,000 (7 cases)[2,3].

An effforts to decrease MMR can be done by increasing the coverage of health services especially delivery assistance by health workers. But in Balangan,

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delivery assistance by health professionals (midwife) only reached 87.6% in 2014. One of the efforts to improve delivery assistance by midwife and reduce the maternal mortality rate through the implementation of a antenatal class pregnancy. Based on research conducted by Saswaty (2010) obtained statistically significant relationship (p=0.005) among pregnant women class participation with election birth attendants[4]. A class of pregnant women aims to increase knowledge, change attitudes and behavior in order to understand about the mother's pregnancy, body changes and complaints during pregnancy, prenatal care, childbirth, postnatal care, and baby care[5],[6].

Based on data from the Health Service of Balangan District the number of pregnant women from the class of 2013 as many as 86 classes, 64 classes became pregnant in 2014 and in 2015 the number of pregnant women were 58 grade class. In the implementation of Pregnancy Class, Midwife have an important role. Midwife act as facilitators or resource persons in the classroom and in each meeting midwife will delivered material appropriate to the needs of pregnant women but still give priority to the subject matter accompanied by the sharing and discussion in its implementation. Additionally outline midwife have a role as a facilitator, motivator and catalyst. As a facilitator midwife should be able to direct the pregnant women to deviate from the rules that have been set. As a motivator midwife should be able to mobilize pregnant women to participate in classroom courses and pregnant women as catalysts midwife should be able give stimulus to the community so that all activities can run smoothly, evolving and improving public health[5].

Based on the background above it is necessary to study how the implementation process of antenatal class pregnancy how to optimize the program and how the midwife's role in the implementation of a class of pregnant women that would affect pregnant women in the choice of childbirth by professional health workers.

MATERIALS AND METHOD

This study uses a qualitative method through indepht interview with explorative approach. Informants in this study were 13 midwife coordinator. The object of research is the role of midwife, improving the help of childbirth, well as implementation of pregnant women classes. While the subject is a midwife in Health Office of Tabalong District Working Area. The chosen location is Balangan District South Kalimantan. The research instruments that can be developed in this research is indepth interview guide. This study used a qualitative analysis used to see the implementation of Antenatal class pregnancy, the role of the midwife as well as obstacles and problems were found.

FINDING

A. Implementation of Antenatal Class Pregnancy

1. Implementation Activities

In the execution of antenatal class pregnancy, midwife has a very important role. Based on the interview with the midwife coordinator known that midwife identify the number of pregnant women and gestational age in the region regularly. On the implementation of the antenatal class pregnancy, midwife/health personnel responsible for the execution of pregnant women class participant identification who will attend antenatal class pregnancy. It is included in the stage of preparation of implementation[6].

The next role of the midwife is provide materials on pregnancy, childbirth, postnatal care and newborn care class activity for pregnant women. Third role is to motivate pregnant women and also her husband to participate in a class husbands of pregnant women at least 1 meetings. Midwife have the role being motivator. Motivator role is to sensitize and encourage the group to recognize the potential and problems, and can develop their potential to solve the problem[7]. The fourth midwife's role is to advocate for support from community leaders and local authorities in the organization of antenatal class pregnancy. The role of midwife in the community midwifery service returned a concern in this case, a midwife not only play a role in maternal and child health services alone but also in advocating for the passage of a program with good health[5].

Based on interview with the midwife at Halong Public Health Center Balangan District, antenatal class pregnancy activities carried out routinely. This is in accordance with the guidelines for the implementation of antenatal class pregnancy by the Ministry of Health Republic of Indonesia, that the execution of antenatal class pregnancy meetings conducted in accordance with the agreement between the midwife/health workers with participants/pregnant women[8]. The scheduled

implementation of antenatal class pregnancy in Balangan did during three meetings by scheduling agreed jointly between midwife and pregnant woman. Only Public Healt Center in Lok Batu Village which states that the implementation of antenatal class pregnancy are not routinely performed. The routine was not intended by the respondent was caused by funding from third parties and class stages pregnant women more than one activity. Meeting time adapted to the readiness of mothers, can be done in the morning or late afternoon meeting with long time of 120 minutes including pregnancy exercise 15-20 minutes[8]. Although the timing of classes maternal health centers in each region varies, but still meet the standards guidelines.

FUNDING

The government's role in the implementation of antenatal class pregnancy in Balangan by providing funds, facilities and infrastructure[8]. Obtaining funds in organizing antenatal class pregnancy in Balangan of them come from the APBD, BOK, Public Health Service, and the funds of stakeholders in this case is PT. ADARO. Obtaining each region has a different health centers. There are several area of health centers that receive funding from stakeholder some are not. On the other hand, there is also the only area health centers to obtain funds from the health department, including the Pirsus II Public Health Center, Uren Public Health Center, and Batu Habang Public Health Center. Based on the interviews, respondents from Pirsus II Public Health Center states that the fund does not meet the target number of pregnant women in one year. PHC have contributed to the budget plan class activities targeting pregnant women with the number of pregnant women in one year[5]. It was concluded that, the greater the amount of funds raised each antenatal class pregnancy. In the implementation of a program, it needs the support and coordination with other agencies, in this case required good communication and continuous[9].

INFRASTRUCTURES

Based on the guidelines for the implementation of antenatal class pregnancy infrastructure that ideal is their[8]:

a. Study room for a capacity of 10 students

b. Stationery writing (whiteboard, paper, markers, pulpen) if there

c. KIA Books

d. Paper sheets antenatal class pregnancy

e. antenatal class pregnancy guidlines book

f. Facilitators handbook

g. Props (KB kit, food models, dolls, kangaroo method, and so on) if there

h. Carpet

i. Pillows and chair (if there)

j. Pregnancy exercise book/ CD

Based on the findings in the field, facilities and infrastructure in the execution antenatal class pregnancy still less than ideal. As stated by respondents in Halong public health centers, facilities and infrastructure that support is still lacking. Based on the guidelines for the implementation antenatal class pregnancy, the lack of facilities and supporting infrastructure. The ingredients found in many health centers Balangan is a mattress. In addition to health centers that have been mentioned above, several other health centers have facilities such as a CD for Pregnancy Exercise, a flip chart, as well as props, but owned by different health centers. It can be concluded from the results of the interview respondents existing health centers in Balangan that facilities and infrastructure owned in running antenatal class pregnancy is still not evenly distributed.

4. Problems and Barriers

Problems were found by officers of antenatal class pregnancy is the presence of pregnant women who are illiterate. This condition is found in the Awayan Public Health Center. Then, the obstacles perceived some health centers in Balangan in the conduct of is too far away access to a class implementation so that the antenatal class pregnancy started late. The next obstacle faced is the lack of funding for transportation from the executor of classroom activities for pregnant women. Another obstacle is still the lack of participation of the husband/ family member faced by several public health centers in Balangan. Husband/family is the one which of target antenatal class pregnancy impllementation[8].

5. Impact of Antenatal Class Pregnancy

Based on the overall results of the interview,

all respondents expressed a positive impact on the implementation of antenatal class pregnancy. The positive impact of the implementation of antenatal class pregnancy to pregnant women healthy and reduce the risk during delivery, among others, is more a patient/pregnant women who changed their behavior of maternity with village shaman into a midwife and in some areas of public health centers in Balangan no longer found the numbers of infant or child mortality. Impacts that will arise from doing health education activities to behavioral change requires a long time, but if such behavior was successfully adopted by individuals or communities, then the change will take some time, perhaps a lifetime to be performed[10].

Based on the results of these observations that the implementation of antenatal class pregnancy from the beginning given positive impact on increasing knowledge of pregnant women and the election of delivery assistance, which is originally from the village shaman turned to health care providers. While the scope of delivery by health personnel is not 100%, but this increase is quite an impact on the increase in deliveries by health workers in Balangan. The results are consistent with research conducted by Kartini (2012) where in this study showed that 95.8% of pregnant women who attend antenatal class pregnancy will selecting health personnel as birth attendants, and the factors that influence voting behavior birth attendants are age, knowledge, distance and travel time to health facilities, the cost of delivered, decision makers, health workers role and support of antenatal class pregnancy participants[11].

B. The Role of Midwife Through Antenatal Class Pregnancy

Based on the interview stated clearly that the midwife mentoring pregnant women with regular classes. This can be evidenced by the role of the midwife in every implementation of antenatal class pregnancy, ranging from coordination to the division of tasks, and the provision of material. However, the obstacles encountered by midwife in performing theirs role is still found the class participants who have received the knowledge about delivery by health personnel but they still birth to the local village shaman. The occurrence of resistance caused by local culture against delivered in the village shaman. Meanwhile midwife initiative in moving the creative antenatal class pregnancy still looks so less, where it is reflected in classroom activities were done only based on the guidance antenatal class pregnancy. This means that antenatal class pregnancy activities carried out for three days with no different activities per day, and generally only three days filled with the provision of material and exercises for pregnant women. The initiative is the ability to perform midwife obstetric care without awaiting orders. It aims to improve the results of the work, creating new opportunities, or avoid problems[12].

C. The Relation of mother's participation in antenatal class pregnancy with the Election of Delivery Assistance

Based on the interview, the relationships of mother's participation in antenatal class pregnancy activities with the election of delivery assistance given very positive influence. Pregnant women tend to choose a birth attendant with health personnel after attending antenatal class pregnancy.

However, some little more still found pregnant women who choose birth attendants with village shaman though after joining the antenatal class pregnancy for reasons of access to a midwife home were too far. Implementation of antenatal class pregnancy provides many benefits. The perceived benefits for the mother and the family are as a means to gain a friend, as a means to ask, and also helps the mother in the face childbirth safe and comfortable, as well as improving knowledge of mothers on maternal and child care after birth. In addition, the benefits of which can be felt health care workers are able to know more about the health problems of pregnant women and their families, as well as being closer to the pregnant women and society[14].

CONCLUSSION

The implementation of antenatal class pregnancy in Balangan District running routinly according to the antenatal class pregnancy guideline through the village midwife's role in carrying out their duties. Still found several problems related to funding not yet equally, the infrastructure is not yet ideal, some pregnant women are illiterate, and the participation of pregnant women family especially their husband not optimal because the reasons such as work.

Need to increase midwife and cadres participation to provide counseling and health education about the importance of antenatal class pregnancy for pregnant

women and their families and the support of all parties. Further research is needed to explore the factors that lead an increase of maternal mortality for developing preventive and promotive programs to reduce maternal morbidity and mortality.

Ethical Clearance: this study approved and received ethical clearance from the Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia. In this study we followed the guidelines from the Committee of Public Health Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia for etchical clearance and informed consent. The informed consent included the research tittle, purpose, participants's right, confidentiality and signature.

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Prevalence and Predictors of Adverse Drug Effects with Second Line Anti-TB drugs Under Programmatic Management of Drug Resistant Tuberculosis (PMDT) Services in Amritsar District

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ABSTRACT

Introduction: The key to successful elimination of tuberculosis (TB) is treatment of cases with optimum chemotherapy. Irrational anti-TB drug use over time has led to drug resistant TB (MDR-TB/XDR-TB). The treatment of MDR-TB with second line drugs is long, complex and costly with considerable rates of adverse effects. The present study was conducted to understand the prevalence and predictors of these adverse effects in order to detect them early and be prepared to take proper steps when they occur. **Materials and method:** This cross-sectional study was conducted on all MDR-TB patients who were registered and being treated under PMDT services in Amritsar district from 1st April 2014 to 31st March 2015. All the possible adverse effects with their predictors were evaluated by enquiring about the related symptoms. Data management and analysis was done by using Microsoft excel and SPSS. **Results:** Out of 87 MDR-TB patients, 57 (65.5%) were males and 30 (34.4%) were females. More than half of the cases i.e. 66.6% among males and 76.7% among females were in the age group of 15-45 years. Male preponderance, with male to female ratio of approximately 2:1 was seen. Adverse effects were present in 92% cases. most common side effects observed were nausea and vomiting in 90.8% followed by Giddiness, over sleepiness, poor concentration, Arthralgia, yellow eyes or skin/abdominal discomfort, dark coloured urine, Skin rashes/pruritus, Blurring of vision, Psychiatric problems/suicidal tendencies, Oliguria/anuria/puffiness of face/pedal edema and others. **Conclusion:** On statistical analysis, it was observed that socio-economic status (p=0.02) and presence of addictions (p=0.00) significantly affected the occurrence of adverse effects. Other factors like age, sex, marital status, education, occupation and family type did not affect the occurrence of adverse effects.

Keywords: *MDR-TB, Adverse drug reactions, second line drugs, Amritsar.*

INTRODUCTION

Ten years ago, the World Health Organization declared tuberculosis (TB) a global health emergency. The key to successful elimination of tuberculosis (TB) is treatment of cases with optimum chemotherapy. Irrational anti-TB drug use over time has led to drug-resistant TB. Multidrug-resistant tuberculosis (MDR-TB) is caused by infection with strains of *Mycobacterium tuberculosis* (*Mtb*) that are resistant to at least isoniazid and rifampicin. [1] As per recent global tuberculosis report of WHO the incidence of MDR-TB is 3.5% among new cases and 20.5% among previously treated for tuberculosis cases. India along with China & Russian Federation contributes to about half the load of MDR-TB cases. [2] The treatment of MDR-TB with second line

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drugs (SLDs) is long, complex and costly, and has a considerable rate of adverse effects Baseline evaluation may help to identify patients who are at increased risk for adverse effects. Regular clinical and laboratory evaluation during treatment is very important to prevent adverse effects from becoming serious. Timely and intensive monitoring for, and management of adverse effects caused by, second-line drugs are essential components of drug-resistant TB control programmes; poor management of adverse effects increases the risk of non-adherence or irregular adherence to treatment, and may result in death or permanent morbidity. Treating physicians should have a thorough knowledge of the adverse effects associated with the use of second-line anti-TB drugs, and routinely monitor the occurrence of adverse drug reactions. [3] This approach ensures better compliance of patients and good treatment outcome.[4] At the same time, data regarding ADRs of second-line anti-tubercular drugs in Punjab are scanty. Hence, the aim of this study was to assess the adverse drug reactions of second-line anti-tubercular drugs used to treat MDR-TB in Amritsar, Punjab.

METHOD

The study was a cross-sectional study conducted on all MDR-TB patients registered and being treated with second line anti-tuberculosis drugs under PMDT services in Amritsar City.

Study sample – All MDR-TB patients registered from 1st April 2014 to 31st March 2015.

Inclusion Criteria- All Drug Sensitivity Tested (DST) confirmed MDR-TB cases who signed written informed consent.

Exclusion Criteria- Pregnant females and critically ill patients who needed management in an Intensive Care Unit (ICU).

Data Collection and Analysis- A total of 87 patients registered with DTC (District Tuberculosis Centre) Amritsar and being treated with second line anti TB drugs were included in the study. A pre-designed and pre – tested proforma was administered to the subjects after taking his/her consent. Questionnaire included questions regarding the socio-demographic profile, addictions (smoking, alcohol intake, tobacco chewing, drug abuse, others) and co-morbidities. Past history, past duration of treatment, family history and occupational history of the patients was also enquired. All the possible side – effects were evaluated by enquiring about the related symptoms. Questions regarding gastro-intestinal symptoms, arthralgia, skin problems, renal complications, psychological problems, etc were included in the questionnaire.

The Socio-economic status was assessed by It was assessed by using Modified Udai Pareek Scale (MUP Score). [5] This Scale comprises of thirteen criteria in rural and twelve criteria in urban set up. These criteria include caste, education, occupation of husband and wife, type of family, size of family, house ownership, household assets, type of house, number of rooms and drinking water facility. In rural set up land holding and farm assets are included instead of house ownership. Each criterion has been assigned a specific number. Summation of these numbers is done with maximum and minimum scoring.

Scoring of adverse effects was done by assigning score 1 to each adverse effect and then by using likert's scale subjects were categorized as having:

No side effects - 0

Mild side effects < 3 score

Moderate side effects3-5 score

Severe side effects > 5 score

Data analysis was done by SPSS version 20. Chi-square test was applied to prove their statistical significance and p-value < 0.05 was considered to be significant.

ETHICS

The research proposal was approved by the college ethical committee at the time of commencement of the study.

RESULTS

The present study was carried out on 87 MDR- TB cases registered under PMDT services in Amritsar city. The prevalence and predictors of adverse effects with second line anti TB drugs were ascertained. The total sample consisted of 57 (65.5%) males and 30 (34.4%) females.

Table-1 Distribution of cases according to sex and age

Age Group (Years)	Male n= 57		Female n= 30		Total n= 87	
	No.	Col%	No.	CoI%	No.	CoI%
15-29	23	(40.3)	15	(50)	38	(43.8)
Row %	(60.5)		(39.5)		(100)	
30-44	15	(26.3)	8	(26.7)	23	(26.4)
Row %	(65.2)		(34.8)		(100)	
45-59	16	(28.1)	7	(23.3)	23	(26.4)
Row %	(69.6)		(30.4)		(100)	
>60	3	(5.3)	0	(0)	3	(3.4)
Row %	(100)		(0)		(100)	

Table-1 shows the sex and age wise distribution of cases. Among the total 87 patients, 57 (65.5%) were males and 30 (34.5%) were females. 43.8% were in the age group of 15-29 years. Out of 57 males more than half of the cases were less than 45 years i.e. 40.3% in the 15-29 years and 26.3% in the 30-44 years age group. Among 30 females, 76.7% were in the age group of 15-44 years.

Table 2-Distribution of cases having adverse effects with the treatment

Adverse effects	No. of cases (n=80)	Percentage
Nausea/vomiting	79	90.8
Giddiness/over sleepiness/poor concentration	53	60.9
Blurring of vision	19	21.8
Oliguria/anuria/puffiness of face/pedal edema	2	2.3
Arthralgia	53	60.9
Skin rashes/pruritus	33	37.9
Yellow eyes or skin/abdominal discomfort/dark coloured urine	36	41.4
Psychiatric problems/suicidal tendencies	11	12.6
Others	71	81.6

*** No. exceeds n due to multiple side effects**

It is evident from the above table that out of the total 87 cases, adverse effects were present in 92% cases. Most common side effects observed were nausea and vomiting in 90.8% followed by giddiness, over sleepiness, poor concentration and arthralgia in 60.9% of cases. Other adverse effects observed were yellow eyes or skin and abdominal discomfort, dark coloured urine (41.4%), skin rashes/pruritus (37.9%), blurring of vision (21.8%), psychiatric problems/suicidal tendencies (12.6%), Oliguria/anuria/puffiness of face/pedal edema (2.3%) and others (81.6%) cases.

Table 3- Distribution of cases showing predictors of adverse effects

	ADVERSE EFFECTS				SIGNIFICANCE
	No (%)	Mild (%)	Moderate (%)	Severe (%)	
AGE (yrs)					
15-29 (n= 38)	3 (7.9)	12 (31.6)	19 (50)	4 (10.5)	$\chi 2$= 10.901
30-44 (n= 23)	1 (4.3)	10 (43.5)	6 ((26.1)	6 (26.1)	*df = 9*
45-59 (n= 23)	0 (0)	6 (26.1)	8 (34.8)	9 (39.1)	
>60 (n= 3)	0 (0)	1 (33.3)	1 (33.3)	1(33.3)	*p = 0.28*
SEX					
Male (n= 57)	1 (1.8)	18 (31.6)	23 (40.3)	15 (26.3)	$\chi 2$= 3.924
Female (n= 30)	3 (10)	11 (36.7)	11 (36.7)	5 (16.6)	*df = 3* *p = 0.27*
MARITAL STATUS					
Married (n= 50)	1 (2)	20 (40)	15 (30)	14 (28)	$\chi 2$= 15.246
Single (n= 28)	3 (10.7)	7 (25)	16 (57.1)	2 (7.2)	*df = 9*
Widow/Widower (n= 9)	0 (0)	2 (22.2)	3 (33.3)	4 (44.5)	*p = 0.08*
EDUCATION					
Above Matric (n= 23)	1 (4.4)	8 (34.8)	11 (47.8)	3 (13.0)	$\chi 2$= 9.196
Matric (n=23)	0 (0)	10 (43.5)	10 (43.5)	3 (13.0)	*df = 9*
Below Matric (n= 19)	2 (10.5)	5 (26.3)	6 (31.6)	6 (31.6)	
No Schooling (n=22)	1 (4.5)	6 (27.3)	7 (31.8)	8 (36.4)	*p = 0.42*
FAMILY					
Joint (n= 28)	1 (3.6)	10 (35.7)	10 (35.7)	7 (25)	*$\chi 2$=0.357*
Nuclear (n= 59)	3 (5.1)	19 (32.2)	24 (40.7)	13 (22)	*df = 3* *p = 0.94*
SOCIO-ECONOMIC STATUS					
High (n= 5)	2 (40)	1 (20)	2 (40)	0 (0)	$\chi 2$= 19.398
Upper Middle (n= 21)	1 (4.8)	6 (28.6)	8 (38.1)	6 (28.6)	*df = 9*
Lower Middle (n= 43)	1 (2.3)	18 (41.9)	15 (34.9)	9 (20.9)	
Low (n= 18)	0 (0)	4 (22.2)	9 (50)	5 (27.8)	***p = 0.02***
ADDICTIONS					
Smoking (n= 39)	0 (0)	1 (2.6)	15 (38.5)	23 (58.9)	$\chi 2$= 69.486
Alcohol (n= 48)	0 (0)	2 (4.2)	21 (43.7)	25 (52.1)	*df = 3*
Others (n= 40)	1 (2.5)	4 (10)	15 (37.5)	20 (50)	***p = 0.00***

Above table illustrates the socio-demographic factors affecting the occurrence of adverse effects in MDR-TB patients on second line drugs. It was observed that socio-economic status significantly affected the occurrence of adverse effects as maximum adverse effects were seen in the lower middle class and cases having high socio-economic status showed minimum number of adverse effects. 55.8% and 77.8% of the cases of lower middle and low class showed moderate to severe adverse effects respectively. The relationship was found to be statistically significant (p=0.02).

It was also observed that presence of addictions also significantly affected the occurrence of adverse effects. 38.5% and 58.9% of cases with smoking showed moderate to severe side effects respectively. Similarly, 43.7% and 52.1% cases with alcoholism showed moderate to severe adverse effects. The relationship was found to be highly significant (p= 0.00).

Other parameters like age, sex, marital status, education family type did not affect the occurrence of side effects.

DISCUSSION

Table 1 shows sex and age wise distribution of cases. It was observed in our study that out of the total 87 patients, 57 (65.5%) were males and 30 (34.5%) were females. Similar male preponderance with 72.9% males and 27.1% females was observed in the study by a study on MDR-TB patients at Abbassia Chest Hospital, Cairo, Egypt in 2015. [6] In the present study it was observed that 52.8% were in the age group of 30-59 years of age i.e. economically productive years of life and only 3 patients were more than 60 years of age. Similarly, a prospective study by Rohan Hire et al in Nagpur (2014) observed that out of the total 110 patients, 40 patients belonged to age group 40-49 years while two patients to age group 70-79 years. [4]

Table 2 reveals that among the total 87 cases, some or the other adverse effects were observed in 80 i.e. 92% cases. Bhatt G et al (2012) in their study observed that ADRs were present in more than 90% cases. [7] Another study by Jacobs TQ et al in South African Outpatient clinic observed adverse effects in 80.6% cases. [8] It was observed in the present study that most common side effects observed were nausea and vomiting in 90.8% followed by Giddiness, over sleepiness, poor concentration and Arthralgia in 60.9% of cases. Other adverse effects observed were yellow eyes or skin and abdominal discomfort, dark coloured urine (41.4%), Skin rashes/pruritus (37.9%), Blurring of vision (21.8%), Psychiatric problems/suicidal tendencies (12.6%), Oliguria/anuria/puffiness of face/pedal edema (2.3%) and others (81.6%) cases. In a study by Haregewoin Bezu et al adverse effects observed were Anorexia 83.3%, Nausea and vomiting 82%, Gastritis 64%, Arthralgia 47%, Skin rash and itching 45%, Headache 29.2%, Depression 22.2%, Blurred vision 19.4%, Renal failure, 6.9% ,dehydration in 5.6% , Sleeping disturbance, 12.5% , Psychosis, 1.4% and Depression, 22.2%. [9] Other studies by Binh Hoa Naguyen in Vietnam (2015), Sagwa E in Namibia (2012), Arbex AM et al (2010) and Baqhaei P et al (2011) showed similar multiple adverse effects with second line anti TB drugs. [10, 11, 12, 13]

In the present study it was observed that age, sex, marital status, education, occupation and family type did not affect the occurrence of adverse effects (Table 3). Adverse effects were more in lower middle class and less in those having high socio-economic status. The relationship was found to be statistically significant (p- 0.02). Also cases with addictions to smoking, alcohol or any other showed more adverse effects as compared to non-addicted cases. This relationship was highly significant (p- 0.00). Bezu H et al in their study found that alcoholism, smoking and concomitant drug intake were independent predictors for ADRs. [9] Chung- Delgado K et al in their study in Lima, Peru (2011) observed smoking as independently associated with adverse reactions. [14]

CONCLUSION

MDR-TB treatment is a major challenge due to the chronic nature of disease, long duration of treatment and multiple drugs used in the regimen. The wide spectrum of potential adverse drug reactions further escalates this challenge. As we could see in our study, 92% of the patients on second line drugs reported adverse drug reactions ranging from mild to severe degree. This can lead to non-adherence to treatment which can negatively impact the treatment outcome. Prompt identification and management of adverse drug reactions holds the key to successful outcome. Therefore, training of primary health care workers to detect adverse drug reactions, development of management protocols feasible at peripheral centres and prompt referral to higher centres if required, can have a major impact on treating the adverse reactions and hence the management of MDR-TB.

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Conflict of Interest: None

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Maxillary First Molar with Two Palatal Canals: A Rare Case Report

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ABSTRACT

Thorough knowledge of clinician about the internal anatomy and its possible variations is very important for the success of root canal therapy. Variations in the no. of roots, root canals and configurations make the therapy more difficult to perform.. Missed and non-negotiable canals during the treatment could affect the outcome of treatment. Clinician should be careful while treating maxillary first molars because of its root curvatures , additional canals and variations in internal morphology. Finding the MB2 canals in the mesiobuccal root is routine. Palatal canal is usually single, large canal which is broad mesiodistally and mirrors the root in which it houses. Rarely there are modifications in palatal canal. This paper presents a rare case report of endodontic management of a maxillary first molar with 2 palatal canals

Keywords: *Maxillary molar, anatomic variations, two palatal canals*

INTRODUCTION

Knowledge of internal dental morphology is an extremely important factor in planning and administering root canal therapy.[1]The success of endodontic therapy depends on proper access preparation, thorough shaping and disinfection and three dimensional leak proof obturation of the entire root canal system. Failure in detecting extra canals and not negotiating the curvatures are prime reasons for treatment failures in endodontics especially in molars. The complexity of the canal system of maxillary molars are always challenging for clinicians.. Maxillary molar is one of the teeth which requires root canal therapy (RCT) quite often. RCT on maxillary 1st molar has tendency to fail because of complicated root morphology and internal anatomy such as buccally curved palatal root which cannot be appreciated in radiographs, quite a number of accessory canals at the apex of palatal root, additional canals such as MB2 in mesiobuccal root, taurodontism, radix entomolaris etc. The most commonly, the maxillary first permanent molar has three roots and mesiobuccal root having two canals (mesiobuccal and MB2) while distobuccal and palatal roots usually having a single canal each. One of the variations in palatal root is having two canals. The occurrence of second mesiobuccal canal is quite common, but occurrence of second palatal canal is usually rare. Christie et al reported maxillary palatal root with two canals for the first time and found 16 cases of maxillary molars with 2 palatal roots during 40years of clinical practice.[2] The incidence of a maxillary first molar with two separate canals in the palatal root is less than 1%[3,4,5]. Stone and Stroner studied the variations of the palatal root of maxillary molars and found that maxillary molar can have a single root with two separate orifices, two separate canals, and two separate foramina, two separate roots, each with one orifice, one canal and one foramen; and a single root with one orifice, a bifurcated canal, and two separate foramen[6]. Baratto-Filho et al assessed internal morphology of maxillary first molars by 3 different methods and found that prevalence of existence of second palatal canal as follows: ex-vivo

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assessment-2.05%, in clinical assessment-0.65% and by cone beam computed tomography-4.55%.[7]

They proposed a classification based on the root separation level and divergence as follows:

Type 1 molars: 2 widely divergent, long, tortuous palatal roots, buccal roots-cow horn shaped, less divergent

Type 2 molars-4 separate roots shorter, run parallel, have buccal and lingual morphology, blunt tooth apices

Type 3 molars-mesiobuccal, distobuccal and palatal engaged in a web of dentin. Distobuccal root may diverge in to distobuccal, standing alone.

The present case report highlights the endodontic management of maxillary first molar with the unusual morphology of three roots and four root canals - two palatal, one mesiobuccal and one distobuccal canals.

CASE REPORT

A 24 year old female patient visited to the department of conservative dentistry and endodontics with a chief complaint of pain in the upper right back tooth region. The pain was intermittent and increasing on intake of hot and cold foods and continue for some time. On clinical examination, it revealed a deep disto-occlusal caries with respect to first right maxillary molar which was mildly tender on vertical percussion. On thermal and electronic pulp testing (Parkell, INC, Edgewood, New York) the tooth showed exaggerated response compared to contra lateral teeth and pain continued even after the stimulus was removed. On radiographic examination, it showed deep carious lesion involving enamel, dentin and pulp with no periapical changes. The tooth was diagnosed with irreversible pulpitis with apical periodontitis.

After careful clinical and radiographic examination, the tooth was referred for endodontic treatment. The tooth was anaesthetized using 1.8ml, 2% lidocaine with 1:200,000 epinephrine. After removal of the carious lesion, access opening was done for right maxillary molar under rubber dam. On inspecting with a DG-16 endodontic explorer (Hu-Friedy, Chicago, USA) under magnifying loupes 2.5 x (Suryadent, Chennai), the pulp chamber floor revealed an unusual two openings in the palatal aspect of the tooth. A mesiobuccal canal, a distobuccal canal and dumbbell shaped 2 palatal canals in the pulp chamber were observed. For proper accessibility and visibility to the palatal canals, the conventional trapezoidal access cavity was modified with additional cove. Pulp chamber had calcification which was removed with ultrasonic access tips. Negotiation of the canals was done with ISO files 08, 10 and 15(DENTSPLY, Maillefer, Switzerland). Fig. 1 showing access cavity preparation with four canal orifices and two palatal canals. Working length was determined using three K-files (DENTSPLY, Maillefer, Switzerland) and one H- file (DENTSPLY, Maillefer, Switzerland). Fig.2 showing four instruments in the canals. Cleaning and shaping of the canals were done with Mtwo rotary files (VDW, Germany) up to 25, 0.6% taper for all the 4 canals using a glide path with RC-prep and canals were irrigated with 3% NaOCl, and saline. Fig. 3 and 4 show master cone selection and obturation respectively. The canals were dried with absorbent paper points (Diadent,Korea) and canals were obturated with gutta-percha cones (Diadent,Korea) with combination of lateral vertical compaction technique along with AH plus sealer.The access cavity was then restored with composite resin. Tooth was referred for full coverage ceramic crown.

DISCUSSION

Locating canal orifices through the pulp chamber is a challenge for endodontist since orifices may have been shifted or having calcification or having additional canals in an unusual location.[8] Clinician should have the experience and appropriate tools to locate even the additional canals and canals located in unusual locations. Preoperative radiographs in different angles or CBCT`s have to be studied well so that canals are not missed. Endodontist should have the skill of locating all the orifices, sometimes through calcific metamorphosis of chambers using loupes or surgical operating microscopes for magnification and ultrasonic instruments for adequate removal of calcification.

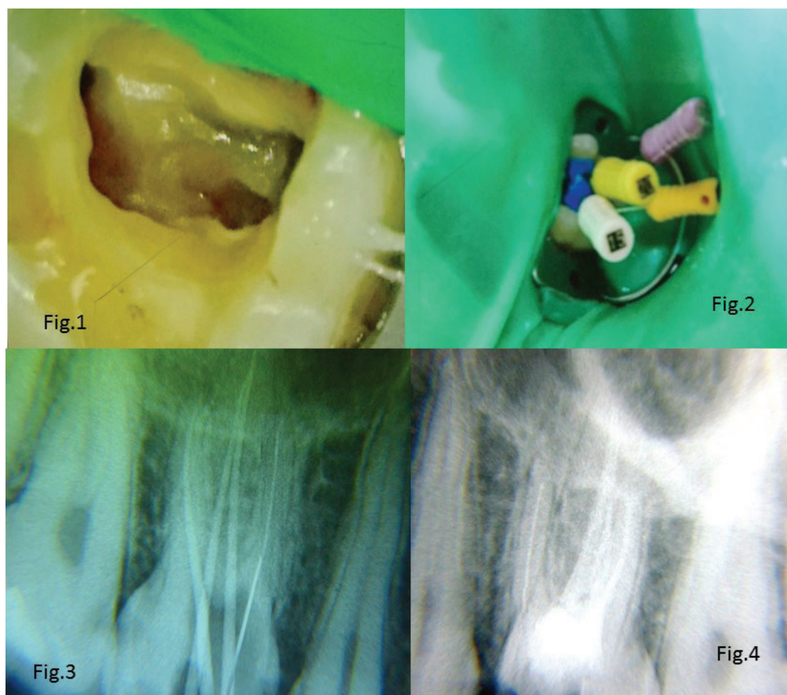

Fig.1: Access cavity preparation showing four canal orifices with two palatal canals highlighted

Fig.2:Four Instruments inserted in the canal

Fig.3:Radiograph showing mastercone selection

Fig 4: IOPA radiograph showing canal obturated

Maxillary first molars are generally difficult teeth for treating endodontically for many reasons such as:

1. Mild to severe curvatures of roots.

2. Can have narrow additional canals in all the roots especially in mesiobuccal root

3. Calcification in pulp chamber

4. Reparative dentin formation from deep carious lesions and repetitive restorative procedures on the floor of the pulp chamber

5. Radix entomolaris and taurodontism are quite common in this tooth.

Hence modifications in the traditional triangular /trapezoidal access opening to expose the mesio-buccal, disto-buccal and palatal canals may be necessary since finding the additional canals will be difficult through this narrow opening. Proper visualization is needed for thorough instrumentation, disinfection and shaping of the canals. Moreover, it is important that the access cavity should have a smooth divergent wall for the straight line access for better treatment outcome. So the access cavity should be extended to have extra cove or shamrock preparation is necessary to locate the extra canals. The access cavities of maxillary molars with 2 palatal canals are usually wider mesiodistally than usual; outline represents square rather than a triangle or trapezoidal.

In the present case maxillary molar had type 2 canal anatomy according to Weine as well as Vertuccii. Two separate canals from the pulp chamber converging to a single canal at the apex, which is very rare in maxillary palatal root.[1,9] According to Christie et al, in maxillary molars with two palatal roots are found once in every 3years of his daily endodontic practice. Several studies have reported high incidence of fourth canal in the mesio-buccal root of maxillary molars and a low incidence has been reported for an extra palatal canal ie. is less than 2%.[2] Holderrieth and Gernhardt [10] and Aggarwal et al [11] reported cases with two palatal canals in a single palatal root. Pradeep Gade et al [12]reported a similar case with two palatal canals in first molar. Anshuman Kharbanda et al also reported a same case with two palatal canals. [13]

In cases of calcification of pulp chamber, sometimes single orifice may get blocked at the orifice and may look like 2 orifices. Ultrasonic tips may help to remove this calcification and help in confirmation of single canal. So endodontist should carefully explore the floor of the pulp chamber to prevent missing canal and prevent perforation of the floor of pulp chamber due to overzealous preparation in search of additional canals.

CONCLUSION

The ability to locate an extra canal in the canal system is an important factor in the success of an endodontic treatment. The incidence of a second palatal canal in the maxillary molars is very low. This paper

highlights the importance of finding additional canals in the root canal system. A clinician should be aware of the variations in the canal anatomy, pre-operative assessment, careful examination of the pulpal floor and use of advanced diagnostic aids like loupes CBCT and ultrasonics for a successful practice.

Ethical Clearance- Taken from Institutional Ethical committee, MCODS, Mangalore.

Source of Funding- Self

Conflict of Interest - Nil

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Intralesional Bleomycin: An Excellent Alternative Method for Oral Lymphangioma in Children

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ABSTRACT

Lymphangiomas are congenital malformations of lymphatic vessels filled with a clear protein rich fluid containing few lymph cells. These lesions are most frequently diagnosed during childhood, are most commonly located in the head and neck region and are extremely rare in the oral cavity. Treatment of oral lymphangiomas is complex due to the difficulty in performing a complete excision. Herewith, we report a case of lymphangioma of buccal mucosa treated successfully with intralesional bleomycin without any recurrence after 18 months of follow up.

Keywords: *Intralesional bleomycin, oral lymphangioma, sclerosing agents.*

INTRODUCTION

There is a controversy on the best definition of lymphangioma, a condition that was first described by Redenbacher in 1828. [1]About 50% of the lesions are noted at birth and around 90% develop by 2 years of age. It is a rare lesion and is mainly located at the dorsal surface and lateral border of the tongue. Its occurrence on the palate, gingiva, oral mucosa and lips is very rare. [2, 3] Despite being a congenital benign lesion, lymphangioma may cause severe aesthetic deformities, and surgical excision is the main treatment. The technique is of complicated execution due to the difficulty to dissect the very thin cystic membrane, being associated with high incidence of relapses, possibly causing both functional and aesthetic impairments. [4] Several alternative techniques to the gold-standard surgical excision have been reported namely aspiration, incision and drainage, use of steroids, chemotherapy, chemical sclerosis and use of laser. [5, 6]Therefore, there is a search for effective and safe alternative methods of treatment. This case report examines the efficacy of bleomycin aqueous solution at a lower dose as the sclerosing agent for oral lymphangioma.

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CASE REPORT

A 10 year old female patient, complain about blisters within oral cavity for one year, which disrupted during feeding and were related commonly to episodes of bleeding. At clinical intraoral examination, we observed vesicular lesions with thin epithelial lining and colour ranging from translucent to yellow-reddish, of soft consistency and sessile insertion, giving to the epithelial surface a granular appearance [figures 1]. There was no abnormality detected in tongue, hard palate, soft palate, oropharynx, gingiva, left buccal mucosa and teeth during examination.

There was no relevant family history. On general examination patient was moderately built and nourished with vital signs within normal limit. On review of system there was no abnormality detected. On extra oral examination there was no gross facial asymmetry and the mouth opening was within normal limit. On palpation there was no significant lymphadenopathy. Clinically, such lesion was diagnosed as lymphangioma and haemangioma. To confirm the diagnosis Punch

biopsy was taken under local anaesthesia with the help of 2.5 mm punch and was sent for histopathological examination.

The histological cuts were examined and stained in hematoxylin and eosin (HE), revealing lymphatic vessels of great diameter distributed in a conjunctive tissue poorly organized. Such vessels were mainly located at subepithelial position, occupying the lamina propria, and presented lumens partially filled by proteic fluid content, erythrocytes, and few lymphocytes [figures 2]. Therefore, the histopathological examination confirmed the clinical diagnosis of lymphangioma.

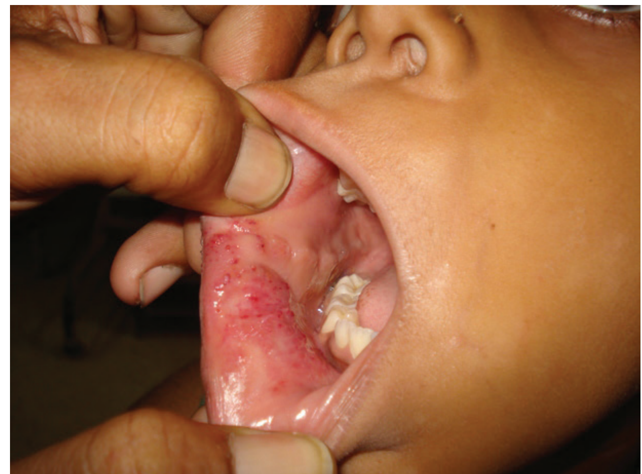

Figure 1 Vesicular lesions with thin epithelial lining and color ranging from translucent to yellow-reddish.

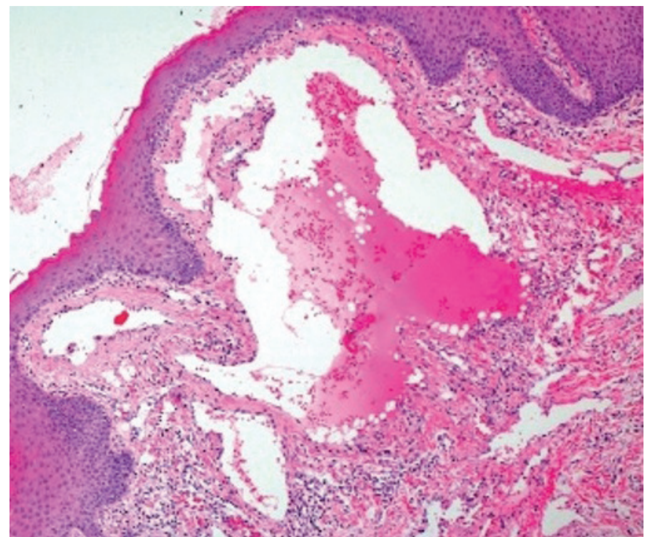

Figure 2 Dilated lymphatic vessels partially filled by proteic fluid content, erythrocytes and few lymphocytes; Lymphatic vessels in subepithelial position.

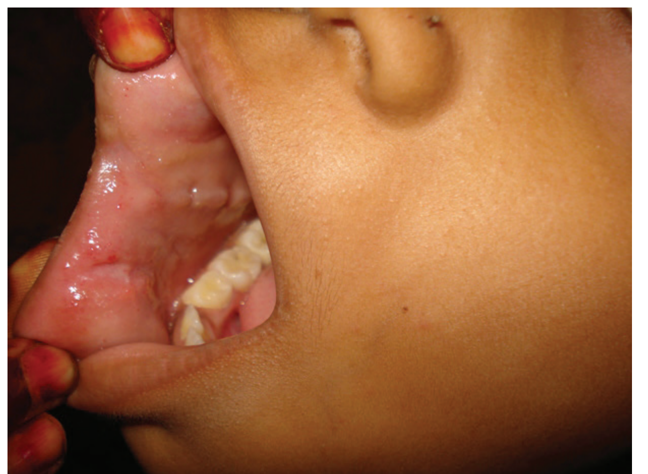

Figure 3 After two months of intralesional bleomycin injection there was complete disappearance of lesions

METHOD

The child was sedated with chloral hydrate. Under aseptic precautions, as much as possible of the lymphangioma was aspirated. The aspirating needle was kept in situ and bleomycin aqueous solution was injected intra-lesionally with the dose not exceeding 0.5 mg per kg of body weight per dose. The solution of bleomycin was reconstituted in such a manner so as to deliver 1 mg/ml. The injection was repeated at fixed intervals of 2 weeks and the cumulative dose of bleomycin was limited to less than 5mg/kg. The response to therapy was monitored clinically by measurement of the length, breadth and area as well as by measuring the two largest perpendicular dimensions, at the beginning and end of the therapy. The response was graded as excellent (total disappearance), good (> 50% reduction), and poor (< 50% decrease). The follow-up period was 12 months. Reduction in the size of the mass was seen by 2 weeks to 6 months and the numbers of injections were four. The total dose given was 22 mg and the dose per kg of body weight was 2.2 mg after completion of the treatment. By the end of two months there was complete disappearance of lesions [figure 3].

All patients received standard instructions for the post procedural period. The patients received 100 mg of ibugesic + paracetamol at 12 h interval during 3 days and 0.12% chlorhexidine mouth washes were prescribed to all patients on the post procedural period.

DISCUSSION

Intralesional bleomycin as a sclerosing solution was used for the first time by Yura et al. [7] Bleomycin aqueous solution as a sclerosing agent has been used by many workers and some of them found that it is not as effective as bleomycin emulsion. Bleomycin has also been shown to be more effective for cystic type as compared with the capillary or cavernous lymphangiomas. [8, 9, 10] Cervical, facial and axillary lymphangiomas are more commonly composed of cystic type. These areas are also cosmetically important; therefore the patient selection for this mode of therapy is important. [9] Pulmonary toxicity is a potential side effect of bleomycin therapy. This risk is related to the dose, an increasing incidence being associated with a total dose of more than 400 units or a single dose exceeding 30mg/m2 of body surface area. Elderly patients and those with underlying pulmonary disease are at increased risk. [11] Due to the potential for airway compromise after bleomycin injection of some cervical lymphangiomas, close monitoring is required for lesions of the anterior neck and floor of the mouth. [11] Intralesional bleomycin aqueous solution has been effective in complete resolution of lymphangioma in 53 to 75 % of the children. [8, 9, 10] The dose of bleomycin used was much lower than that likely to cause pulmonary toxicity. The summated dose with bleomycin solution for cystic lymphangioma has been described to be 5mg/kg and minimum dose per injection is 1 mg per kg.[10,11] The desired effect of sclerosis is achieved by the local action of bleomycin, which in turn would depend upon the availability of the drug per unit of surface area of the lesion.[11,12] Hence the dose injected should depend upon the size of the lesion rather than weight of the patient and sclerosis can be induced by a much smaller dose than the weight of the patient would warrant. Another factor, which would influence the dose to be injected, is the completeness of the aspiration of the lesion. The drug would get diluted in the lymphatic fluid and less drug per unit of surface area would be available for the sclerosing effect. The exact dosage requirement per unit of volume of the lesion has not been worked out and it will probably require further trial with lower doses.

Ethical Clearance- Taken from Institutional Ethical committee, School of Dental Science, Sharda University

Source of Funding- Self

Conflict of Interest: “no conflict of interest”

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Clinicopathological Study of Breast Cancer in a Tertiary Care Hospital in Muzaffarnagar- Uttar Pradesh

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ABSTRACT

Background: Carcinoma breast is one of the most common cancer affecting the woman with wide variation in clinical profile from region to region.

Aims: The present study aimed to describe some of the clinical and pathological features of carcinoma breast in and around Muzaffarnagar.

Material and Method: This was a descriptive cross sectional retroprospective study performed on 114 cases of carcinoma breast encountered during a period of five years (July 2011 to June 2016).

Results: The age range of these patients was from 27-70 years with mean age of 48.85 years. Most of the cases presented with lump in the upper outer quadrant of the left breast. In majority of the cases the size of lump was more than 2.0 cms. Invasive carcinoma of no special type (NST) was the commonest histological type. Majority of patients presented with stage II disease followed by stage III.

Conclusion: It was concluded that most of the patients presented in the late stage of the disease due to lack of education and awareness of the disease.

Keywords: *Breast Cancer, Invasive carcinoma, Modified Radical Mastectomy, Female, Clinical profile.*

INTRODUCTION

Breast cancer is the most common malignancy in the woman, affecting one in eight in the western world[1]. In India, breast cancer is the second most common cancer in woman after cervical cancer. However, recent studies have indicated a changing trend with an increasing incidence of breast cancer and decreasing incidence of cervical cancer[2]. Globally, it accounts for 25% of female cancers and 18% of deaths from cancer in woman[3]. Several well established factors have been associated with an increased risk of breast cancer. These include age at presentation, male to female ratio (1:100), family history in mother and grandmother, nulliparity, late menarche and late menopause. Some other factors like radiations, use of oral contraceptive pills, smoking and obesity also increase the risk of breast cancer. World Health Organisation focuses on early detection of breast cancer by promoting breast self examination (BSE) and screening in targeted group The incidence, clinical presentation and survival rates vary in different geographic areas and among different races and ethnic communities within the same geographic region[4] . A number of studies have been published with respect to clinical and pathological profiles of breast cancer patients from India. However, no such study has been published from Muzaffarnagar area of Uttar Pradesh to the best of our knowledge. So the present study was aimed to evaluate certain clinical and pathological features of breast cancer patients diagnosed and managed at our tertiary care hospital.

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MATERIAL AND METHOD

Present study was conducted in Department of Pathology and Department of Surgery in Muzaffarnagar Medical College on 114 patients encountered during July 2011 to June 2016 after the permission of institutional ethical committee .We reviewed records of these cases with respect to age, site, side, size, histological type, grade, stage and lymph node status. Grading of the tumour was done by Nottingham modification of the Bloom Richardson system 1991[5] and staging was done by AJCC classification 2009[6].

STATISTICAL ANALYSIS

A descriptive statistical analysis was done for all the parameters

OBSERVATIONS

The study was carried out on 114 cases. The age range of these patients was from 27-70 years with mean age of 48.85 years. Maximum number of cases was in the age range of 40-49 years (Table -1)

Majority of the cases presented with breast lump alone (98%). Rest presented with lump and erosion of nipple or lump with nipple discharge .In majority of the cases lump was observed in left breast, followed by right side and in one case it was bilateral (Fig 1). Upper outer quadrant was the commonest site followed by central, upper inner, lower outer and least number was observed in lower inner quadrant (Fig 2). Size of the tumour varied from 1.4 to 17.0 cm. Majority of the cases had tumour size between 2-5 cms (Table 2).

Out of 114 cases, 56 cases underwent modified radical mastectomy and in rest 58 cases lumpectomy was performed. The cases were classified according to WHO classification (2012)[7]. Invasive carcinoma of no special type (NST) formed the bulk of cases (91.23%) (Table 3).

Grading of these cases was done according to Nottingham modified Bloom Richardson method (Elston & Ellis, 1991)[5]. Majority of cases were in grade II followed by grade I and grade III (Fig 3).

Out of 56 cases of modified radical mastectomy, 29 (51.79%) cases showed lymph node metastasis and 27 (48.21%) cases were free from tumour deposits. Staging was done by AJCC classification (2009)[6]. Majority of cases were in stage II followed by stage III and stage I.

TABLE-1: AGE RANGE OF BREAST CARCINOMA CASES (n=114)

Age in years	Number of cases	Percentage
20-29	4	3.51
30-39	18	15.79
40-49	44	38.60
50-59	20	17.54
60-69	25	21.93
70-79	03	2.63
Total	**114**	**100.00**

TABLE–2: DISTRIBUTION OF BREAST CARCINOMA CASES ACCORDING TO SIZE (n=114)

Size	Number of cases	Percentage
≤ 2 cm	10	8.77
> 2-5 cm	70	61.40
> 5 cm	34	29.82
Total	**114**	**100.00**

TABLE-3: MORPHOLOGICAL DIAGNOSIS OF THE BREAST CARCINOMA CASES

Histological Type	Number of cases	Percentage
Invasive carcinoma of no special type (NST)	104	91.23
Invasive lobular carcinoma	2	1.75
Carcinoma with neuroendocrine differentiation	2	1.75
Metaplastic carcinoma (squamous cell variant)	2	1.75
Mucinous carcinoma	1	0.88
Medullary carcinoma (Typical)	1	0.88
Secretory Carcinoma	1	0.88
Medullary (Atypical)	1	0.88
Total	**114**	**100.00**

TABLE-4: DISTRIBUTION OF CASES ACCORDING TO TNM STAGE (n=56)

TNM Stage	Number of cases	Percentage
Stage 0	00	00.00
Stage I A	01	01.79
Stage I B	00	00.00
Stage II A	19	33.93
Stage II B	16	28.57
Stage III A	11	19.64
Stage III B	00	00.00
Stage III C	09	16.07

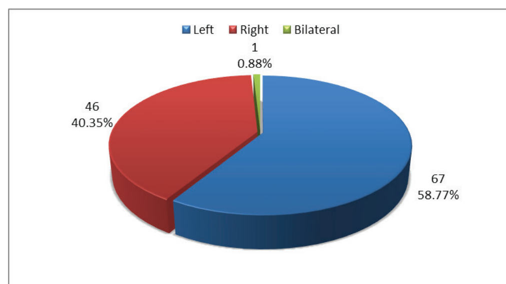

Figure-1: DISTRIBUTION OF BREAST CARCINOMA CASES ACCORDING TO SIDE (n=114)

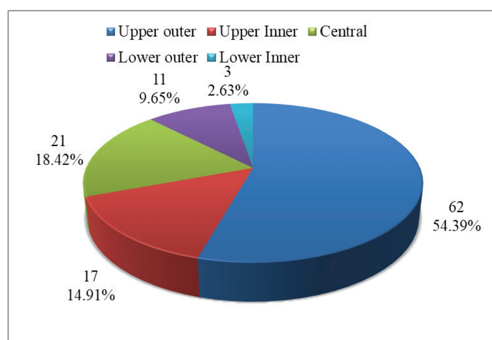

Figure-2: DISTRIBUTION OF BREAST CARCINOMA CASES ACCORDING TO SITE (n=114)

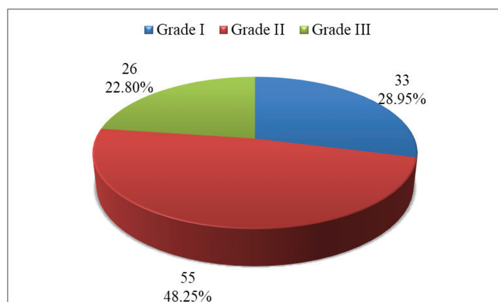

Figure 3: GRADING OF BREAST CARCINOMA CASES ACCORDING TO NOTTINGHAM MODIFIED BLOOM RICHARDSON METHOD (n=114)

DISCUSSION

Breast cancer (BC) is one of the most common malignancy in women. The tumour is highly heterogeneous with a wide range of biological, pathological and clinical characteristics. In the present descriptive retroprospective study we analysed institutional data of the last five years in breast cancer patients.

Age:-

In the present study the largest number of cases were in the age group of 40-49 years The results of this study were similar to those of Puvitha & Shifa (2016)[8] who also reported peak age range of breast carcinoma cases between 41-50 year. Ejam and Farhood (2013)[9] observed the peak incidence as 30-50 years.

The mean age of breast cancer patients in this study was 48.85 years. The average age of patients in few hospital based cancer registries ranged from 44.2 years in Dibrugarh, 46.8 years in Delhi, 47 years in Jaipur to 49.6 years Bangalore and Chennai[10].

Woman in India have shown to develop breast cancer a decade earlier than the western population where woman mostly develop cancer post menopausal in their 7th and 8th decade[11]

Side:-

In the present study 58.77% tumour were on the left side,40.35% were on the right side and 0.88% were bilateral. Geethamala et al[12] also found marginally more cases on left side than right with a single case of bilateral breast carcinoma

It has been observed in the past also that breast carcinoma are more common in the left breast than in the right. The left breast being more bulky and is having a larger volume of breast tissue comparatively. However, side of the breast involved has no clinical significance.[13, 14]

Site:-

The upper outer quadrant, which is the most common site for carcinoma breast as per standard text book of Surgery[15] was the most common site for the tumour with 54.39% of the tumours situated in this location in the present study also. A number of workers in the past have also reported upper outer quadrant to

be the commonest quadrant involved in breast cancer patients.[16, 17, 18]

Size:-

In the present study, 91.22% tumours were more than 2.0 cm, only 8.77% of the tumours were less than or equal to 2.0 cm. Almost similar results have been reported in other studies such as by Bhagat et al (91.38%)[19], Azizun et al (88 %)[20] and Nikhra et al (95.4%)[21]. While study from western country showed 71.4% cases with more than or equal to 2.0 cm size, Adedaya et al 2009[22], this could be due to early cancer detection program. In India owing to the lack of awareness of this disease and in absence of a breast cancer screening program, majority of breast cancers are diagnosed at a relatively advanced stage.[23] Surgery was performed initially on all the patients. The acceptance of BCS in India is different from that in developed countries. Data from American College of Surgeons showed that in 1995, 58% of stage I and 36% of stage II cancers were treated by breast sparing techniques.[24]

Histological Type:-

In the present study, invasive carcinoma of no special type (NST) was the commonest histological type (104,91.23%) followed by invasive lobular carcinoma (2,1.75%), carcinoma with neuroendocrine differentiation (2,1.75%), metaplastic carcinoma (squamous cell variant) (2,1.75%), mucinous carcinoma (1,0.88%) and medullary carcinoma (1,0.88%), medullary carcinoma (atypical) (1,0.88%) and secretory carcinoma (1,0.88%). Almost similar results have been reported in the past by various workers. [8,21,25,26]

TNM Staging:-

TNM stage at presentation at 4 major cancer centres in India indicated that almost 50% of patients present with locally advanced disease. Quite a few patients have large operable breast cancers. Some 8-10% of patients have TNM stage IV disease at presentation, and only very few (approximately 5%) have stage I disease.

In the present study stage II was the most common breast carcinoma (59.10%) followed by stage III (38.63%) and stage I (2.27%). This is almost similar to a study at Mumbai.[28] In Shrivastava et al[18] study also most of the patients of carcinoma breast presented in stage II (45.7%) followed by stage III (32.8%), stage IV (17.1%) and stage I (4.2%).

In Western countries, stage I (56.4%) are the majority followed by stage II and III possibly due to increased awareness and aggressive breast screening programs.[29,30]

Grade:-

All the cases were graded according to Nottingham modification of Bloom Richardson method. Majority of the cases were in grade II (48.25%) followed by grade I (28.95%) and grade III (22.80%). A large number of studies have reported majority of patients in grade II. [8, 12, 20,31,32,33]

LIMITATION OF THE STUDY

Being a hospital based observational study; it may not represent underlying general population.

CONCLUSIONS

Data from the present study indicated that most of our patients were below 50 years of age. Cancer of breast increased with increasing age up to 70 years of age after that there was sharp decline .Main clinical presentation was lump in upper outer quadrant on left side in majority of the cases. Invasive carcinoma of no special type, grade II was the commonest histological type.

A drive for general awareness regarding self examination of breast is important at various levels for early diagnosis, many females do not consult a male doctor specially surgeon due to social hesitation and lack of awareness. With the help of educational health awareness and group education therapy we can make them understand the importance of early diagnosis and treatment.

Conflict of Interest:- None

Source of Funding: - None

Ethical Clearance: - Taken from Institutional ethical Committee

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Spectrum of Lymphadenopathies on Fine Needle Aspiration Cytology in and around Muzaffarnagar

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ABSTRACT

Background: Lymphadenopathy is one of the commonest clinical presentation of the patients. Fine Needle Aspiration Cytology (FNAC) is a diagnostic technique useful in management of various lymphadenopathies.

Aims: The study was performed to assess the role of FNAC in the diagnosis of various lymph node lesions and to study cytological features of various lymph node lesions.

Methods: Two hundred and sixty seven cases were studied from July 2015 to June 2016 in the department of Pathology at Muzaffarnagar Medical College and Hospital, Muzaffarnagar.

Results: the age of these patients ranged from 2years to 78 years, maximun number of cases in the age group of 21-30 year. There was female preponderance. The most common lesion encountered was reactive lymphadenitis (36.33%) followed by granulomatous lymphadenitis (22.10%), tubercular lymphadenitis (17.98%), metastatic lesion (10.49%), acute lymphadenitis (8.61%) and lymphoma (4.12%). The most common site involved was cervical lymph node (83.15%). The most frequently encountered size was in the range of 1-2 cm (42.32%).

Conclusion: FNAC is a useful tool in diagnosing both non-neoplastic and neoplastic lesions and is more successful in a close set up with constant interaction and feedback between clinicians and pathologists.

Keywords: *Lymphadenopathy, Tubercular, Lymphoma, FNAC, Granulomatous.*

INTRODUCTION

Lymph nodes are a part of peripheral immune system located along the course of lymphatic vessels. Lymph node lesion is one of the commonest clinical presentation of the patients and can be due to many causes. The etiology varies from an inflammatory process to a malignant condition[1]. Enlarged lymph nodes were the first organs to be sampled by Fine Needle Aspiration Cytology[2]. It is a simple outpatient procedure that requires an ordinary disposable 5/10 ml syringe and 21-23 gauze disposable needle. It allows an immediate assessment of adequacy of the specimen. If the sample is inadequate or unsatisfactory, the aspiration can be repeated as the procedure causes minimal discomfort to the patient.

Definite diagnosis of lymph node lesion depends mainly on excision of the gland and histopathological examination. Surgery requires hospitalization and exposes patients to the risk of post operative infection and possibility of tumor seeding. FNAC on the other hand is free from these disadvantages and can be safely used as an alternative or complementary investigative technique.

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MATERIAL AND METHOD

The prospective study of Fine Needle Aspiration Cytology in lymphadenopathies was conducted between July 2015 to June 2016 at Department of Pathology, Muzaffarnagar Medical College, Muzaffarnagar. All cases of lymph node lesions where adequate material was aspirated were included in the study.

Out of a total of 279 cases, in 12 cases smear was inadequate and hence were excluded from the study. Thus present study included 267 cases. These patients were clinically evaluated and informed consent was obtained. Aspiration was done by using 22 gauze needle and prepared slides were stained with Giemsa, ZN stain, PAP and H&E

STATISTICAL ANALYSIS

All the parameters were expressed in percentage (%)

RESULTS

The age of the patients ranged from 2 years to 78 years. Male to female ratio was 0.8:1 The maximum number of cases were seen in the age group of 21-30 year Smallest lymph node lesion measured was 0.5 cm and largest measured was 8 cm in maximum dimensions. Most of the lymph node lesion ranged in size between 1-2 cm (42.32%). Cervical lymph nodes constituted the commonest site of aspiration (83.15%) followed by axilla (13.11%) and inguinal lymph node (2.62%).

Out of 267 cases, 228 (85.39%) were of benign lymphadenopathy and 39 (14.61%) were malignant, (Table1).

Reactive lymphadenitis (36.33%) was the most common lesion followed by granulomatous lymphadenitis (22.10%), tubercular lymphadenitis (17.98%), metastatic lesion (10.49%), acute lymphadenitis (8.61%) and lymphoma (4.12%) (Table2).Reactive lymphadenitis was most common in first two decades of life (61.86%) and cervical lymph node was most commonly involved.

In Tubercular lymphadenitis predominant cytomorphological pattern was epithelioid cell granuloma with necrosis (72.92%). AFB positivity was maximum in group with caseous necrosis only (50%), followed by cases with epithelioid cell granuloma and necrosis (42.86%) and least positivity was seen in cases with epithelioid cell granuloma without necrosis (20%)(Table 3).

The commonest site involved was cervical. Axilla was the next frequent site followed by inguinal. In only two patients generalized lymphadenopathy was seen (Table 4).

Metastatic group comprised of 28 cases. Fourteen cases were from Squamous cell carcinoma, 6 were from Undifferentiated carcinoma, 3 were from Breast carcinoma, 2 were from Adenocarcinoma and 1 was from Nasopharyngeal carcinoma

There were 11 cases of Lymphoma. Hodgkin lymphoma (63.46%) was more than Non Hodgkin lymphoma (36.36%).

TABLE NO.-1: Distribution of Benign and Malignant lesions according to age group

AGE group in years	NUMBER OF CASES	
	BENIGN	MALIGNANT
1-10	40 (14.98%)	4 (1.50%)
11-20	57 (21.35%)	2 (0.75%)
21-30	76 (28.46%)	6 (2.25%)
31-40	28 (10.49%)	5 (1.87%)
41-50	17 (6.37%)	4 (1.50%)
51-60	08 (2.99%)	10 (3.74%)
61-70	02 (0.75%)	06 (2.25%)
71-80	00	02(0.75%)
TOTAL	228	39

TABLE NO.-2: Cytological diagnosis by FNAC of lymph node lesions

Cytological Diagnosis	NO. OF CASES	PERCENTAGE
Reactive Lymphadenitis	97	36.33%
Granulomatous Lymphadenitis	59	22.10%

***Cont...* TABLE NO.-2: Cytological diagnosis by FNAC of lymph node lesions**

Inflammatory Nonspecific Inflammation 1. Acute Suppurative Lymphadenitis 2. Acute necrotizing lymphadenitis Specific 1. Tubercular lymphadenitis 2. Kikuchi Fujimoto disease	09 14 48 01	3.37% 5.24% 17.98% 0.37%
Neoplastic Lesion Primary Lymphoid malignancy 1. Hodgkin lymphoma 2. Non-hodgkin Lymphoma Metastatic lesion	07 4 28	2.62% 1.50% 10.49%
Total	**267**	**100%**

TABLE NO.-3: Cytomorphological features in tuberculosis lymphadentitis correlating with AFB

TYPE	NO. OF CASES	%age	AFB	% of AFB
Epitheloid cell granuloma with or without langhans giant cell without necrosis	5	10.42%	1	20%
Epithelloid cell granuloma with or without langhans giant cells with necrosis	35	72.92%	15	42.86%
Necrosis with or without PMN and occasional epitheloid cell	08	16.66	4	50%
Total	**48**		**20**	

TABLE NO.-4: Distribution of lymphadenopathy according to the site

Site	No. of Cases	Percentage
Cervical	222	83.15%
Axillary	35	13.11%
Inguinal	07	2.62%
Occipital	01	0.37%
Generalized	02	0.75%
Any Other	00	00
Total	**267**	**100%**

DISCUSSION

FNAC is a simple, repeatable and reliable investigatory modality. FNAC of lymph node is one of the routinely used diagnostic procedure in patients presenting with lymphadenopathy.

The age group which was studied ranged from 2-78 years with maximum cases in the age group of 21-30 years which is comparable with those of Patel MM et al[3], More SA et al[4] and Kochhar et al[5]. While Gupta SK et al[6] observed maximum number of cases in 31-40 years of age group. In present study a female preponderance was noted. Similar female preponderance was noted by Rajbhandari et al[7].

The most frequent site for FNAC was cervical (83.15%) followed by axillary (13.11%). Similar findings were also observed by Khajuria et al[8], Hirachand et al[9], Kochhar et al[5] and Pavithra P et al[10]. Most of the lymph nodes (42.32%) ranged in size between 1-2 cm which was in concordance with Vimal S et al[11].

The most common cytological diagnosis was reactive lymphadenitis (36.33%). Similar findings were observed by Vimal S et al[11], Hemalatha A et al[12], Hirachand et al[9] and Ahmad SS et al[13].

However Pandav AB et al[14], Kochhar AK et al[5] and Khajuria R et al[8] found tubercular lymphadenopathy as the most common lesion.

Reactive lymphadenitis was most common in first two decades of life (61.86%). Present study correlated with Kochhar AK et al (60%)[5] and Khajuria R et al (74.50%)[8].

Granulomatous lesion was the second most common lesion (22.10%). Findings of the present study correlated with Anuradha S et al[15]. Tubercular lymphadenitis formed the third largest group of lesions with an incidence of 17.98%. ZN staining for AFB was positive in 41.67% cases and was comparable to Ahmad SS et al (46%)[13] and Hemalatha A et al (52%)[12].

Out of 267 cases , 23 cases were diagnosed as non – specific lymphadenitis i.e 8.61%, this rate was comparable to those of other authors as Patra et al[16] and Kanhere S et al[17].

In this study, there were 28 cases (10.49%) of metastatic lesion. Findings were in correlation with Hirachand et al (12.3%)[9] Most of the metastatic deposits were from squamous cell carcinoma (50%). Findings correlated with Hemalatha A et al (60%)[12], Kochhar AK et al[5] and Patel MM et al (75.5%)[3]. Malignant lymphoma formed 4.12% cases of all lymph node lesions . Present study was comparable to Ahmad SS et al[13] and Kumar H et al (4.2%)[18].

There were seven cases of Hodgkin lymphoma and four cases of Non Hodgkin lymphoma, ratio being 1.75: 1. This finding was in conjunction with the study of Ahmad SS et al[13] who observed a ratio of 2:1.

CONCLUSION

FNAC is a safe, rapid and cost effective in diagnosing various causes of lymph node lesions. In most of the situations, FNAC can give a reasonably accurate diagnosis to manage a patient so surgical procedure like biopsy can be avoided.

Conflict of Interest- None

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Ethical Clearance - Taken from Institutional ethical committee

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The Performance of Medical Laboratory Technician Based on Situation Awareness and Psychological Capital with the Work Engagement Mediation

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ABSTRACT

The result of laboratory examination in three districts of South Kalimantan, as much as 36,36% has good quality examination and 63,64% has not good. These facts prove that the performance of laboratory technician who do the analysis of the test material is still not good and the performance is influenced by organizational factors and individual workers. The purpose of this study was to analyze the performance of medical laboratory technician based on individual factors of situation awareness and psychological capital that can influence the performance with the work engagement mediation. This type of the research was an observational analytic study and cross sectional design with 150 subject samples. The result that the situation awareness has a significant effect on performance with regression coefficient 0.242 with p-value <0.001 or critical ratio value 3.5 bigger than critical t-statistic value at 95% with confident interval (≥1.96). Psychological capital has a significant effect on performance with unstandardized regression coefficient of 0,239 with p-value <0.001 or critical ratio value equal to 3,095 bigger than critical t-statistic value at 95% confident interval (≥ 1.96). Situation awareness and psychological capital have a positive effect on work engagement. The identification of influence relationships shows that the situation awareness and psychological capital affect the performance of medical laboratory technician and mediated by work engagement.

Keywords: *situation awareness, psychological capital, work engagement and performance.*

INTRODUCTION

Medical Laboratory is a health laboratory conducting medical specimen examination service to get information about individual health especially to support disease diagnosis, healing disease and health restoration.[1] Laboratory performance can be determined through assessment of the results of inspection or analysis of materials or specimens performed by laboratory personnel.

The evaluation result of the National Program for External Quality Consolidation for Medical Chemistry during 2013 in three laboratories of District General Hospital in Kalimantan Selatan showed 36.36% good quality inspection and 63.64% was not good. It can be interpreted that the performance of the hospital laboratory, especially on medical chemistry parameters was still not good, although the hospital laboratory has been supported by infrastructure facilities such as building and laboratory equipment, human resources (laboratory technician), as well as materials or reagents according to standard laboratory services. This fact is evidence that the performance of laboratory personnel who conducted the analysis of the test material was still not good.

The measurement of laboratory techinician performance can use several performance dimensions of quality, quantity, and timeliness.[2] Factors that may affect the performance of medical laboratory technician include organizational and individual factors.[3] So to

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improve the performance of laboratory technician in the service, need to know the most influential factors to improve the performance of technicians. The purpose of this study was to analyze the performance of medical laboratory technicians based on individual factors of situation awareness and psychological capital officials who can influence the performance with work engagement mediation.

MATERIALS AND METHOD

Analytical observation research uses cross sectional approach to know the relationship or influence between exogenous variables on endogenous variables by measuring the situation awareness, psychological capital and work engagement as mediator on the performance of medical laboratory technicians in the hospital service at one time (point time approach) . The study in this research was to look for each influence of exogenous variable that is; situation awareness and psychological capital to endogenous variables namely; work engagement and performance of medical laboratory technician. This study aims to find and build a theoretical model of influence situation awareness and psychological capital on the performance of medical laboratory technician with work engagement as a mediator to be tested empirically.

Population in this research is medical laboratory technician that consist; Medical Laboratory Technologist (ATLM), paramedics and head of installation as well as in charge of the hospital laboratory at the district in Banua Anam (six districts) of Kalimantan Selatan province, namely; (1) General Hospital of Datu Sanggul, Tapin District (2) General Hospital of H. Hasan Basery Kandangan, Hulu Sungai Selatan District (HSS), (3) General Hospital of H. Damanhuri Barabai, Hulu Sungai Tengah District, (4) General Hospital of Pambalah Bantung Amuntai, Hulu Sungai Utara District, (5) General Hospital of Balangan and (6) General Hospital of H. Badrudin Tanjung, Tabalong District. Determination of the sample size using Slovin formula and the minimum rule required by Structural Equation Modeling (SEM) analysis, then from both approaches will be taken an adequate sample size and done by random sampling technique, and got the number of samples of 150 subjects.

The instrument that used in this research was a scale to measure situation situation awareness, psychological capital, work engagement and performance of medical laboratory technician. Items are arranged based on each research variable that is downgraded to dimension or sub variable, then the indicator of each dimension or sub variable is made, from the indicator is prepared the question items. The scale is pre-tested on a limited basis with small samples (± 30) and then consulted with the expert and then tested the validity and reliability. Validity test is done by using Karl Pearson product moment correlation coefficient. Scale is reliable if the respondent's answer to the statement is consistent or stable over time. Reliability test is based on Alpha Cronbach value, if Cronbach Alpha value> 0.60.

Data analysis using univariate analysis to get picture of characteristic variable and frequency of each variable. Structural Equation Modeling (SEM) analysis was used to analysis the effect of situation awareness and psychological capital variables and work engagement mediation on the performance variables.

RESULTS AND DISCUSSION

Result of data analysis on regression coefficient of structural model relationship between the situation awareness variable, psychological capital, work engagement, and performance of medical laboratory technician shows that all relationships between variables are significant. The situation awareness has a significant effect on the performance of medical laboratory technician. This is shown by unstandardized regression coefficient of 0.242 with p-value <0.001 or critical ratio value of 3.5 bigger than the critical t-statistical distribution value at 95% confidence interval (≥ 1.96). Situation awareness also has a positive effect on work engagement. This is indicated by unstandardized regression coefficient of 0.621 with pvalue <0.001 or critical ratio value of 5.644 greater than the critical t-statistical distribution value at 95% confident interval (> 1.96). Psychological capital has a significant effect on the performance of medical laboratory technician. This is indicated by unstandardized regression coefficient of 0.239 with p-value <0.001 or critical ratio value of 3.095 bigger than the critical t-statistical distribution value at 95% confident interval (≥ 1.96). Psychological capital also has a positive effect on work engagement. This is shown by unstandardized regression coefficient of 0.975 with pvalue <0.001 or critical ratio value of 11.066 greater than the critical t-statistical distribution value at 95% confident interval (> 1.96). The identification result of the relationship showed that the situation awareness

(regression coefficient 0.757) and psychological capital (regression coefficient 1.111) have an effect on to the performance of medical laboratory technician and mediated by work engagement.

The situation awareness can directly affect the performance of laboratory technician, but the effect is greater when mediated by work engagement. The situation awareness can affect performance.[4] Other research is suggested that situational awareness has a great positive effect on one's performance. Situation awareness is a variable that gives a lot of influence to performance, and the rest is influenced by other variables.[5] The results showed that laboratory technician with perception level in high situation awareness, also most have high quality of work in high performance. The percentage of medical laboratory technician with low work engagement will be followed by low laboratory staff performance. This relate with the research that also states that employee's work and performance work have a very direct relationship, if the employee's work engagement is high, will have an impact on high performance, and vice versa.[6] Situation awareness with mediated work engagement has a significant effect to improve the performance of medical laboratory technician.

The situation awareness is related to performance in terms of understanding and predictions of technician performance and is a primary goal in analyzing human factors, their interactions and actions in the environment.[7] The interaction and actions of technicians with their fellow technicians and good working environment will make good relationships between technician each others with their work environment, if good technician relations are created then work engagement can also be realized because of the good condition among fellow technicians as well as the environment has been created well. Interaction between employees and employers as a form of performance attachment can be realized with the situation awareness is good by workers. Creation of a good relationship is one of the images or reflection of positive employee performance.[8] A good awareness of the situation will affect the quality of the decision and subsequently the quality of the decision will affect the performance, otherwise misperception, understanding, and prediction will result in faulty decision making, then performance will be bad.[9] Inability to do situation awareness is one of the factors causing errors or human error in pre analytic and analytic stages. Situational awareness is an ability to identify, analyze and translate comprehensively the critical elements of information about what happened.[7]

Psychological capital (PsyCap) has a positive effect on the performance of medical laboratory technician. This corresponds to another study which states that PsyCap is related to the performance.[10] Overall PsyCap (hope, self-efficacy, reslience, optimism) as a multidimensional construct has a positive effect on the performance.[11] PsyCap can have a direct positive effect on performance, but the effect is greater when mediated by work engagement. High-level of PsyCap concepts relate to high-level work engagement and organizational commitment.[12] Optimism as a dimension of PsyCap is mediated by the organizational effort, reward, and support factor in influencing work engagement (vigor, dedication, and absorption) furthermore it will affect performance. The laboratory technician who has a good morale, has confidence in his job, and can solve the problem well, will make the officer more enthusiastic in working with positive energy on him, make the officers more enthusiastic in working, and feel happy with his work.

Engagement in the high levels will have a positive effect on the performance in the higher levels of groups, units, and organizations.[11] The engagement work of employees and performance have a direct proportional relationship, that is, if high work engagement will have an impact on high performance of employees, and vice versa.[6] Employees who are fully engaged will feel good about the work they do and increase the employment attachment when carrying out the work.[8] So PsyCap of medical laboratory technician mediated with work engagement will also be able to significantly improve officer performance.

Therefore, it is necessary to increase the knowledge of the officer regarding the situation awareness and psychological capital combined with the improvement of work engagement to the medical laboratory technician so that the performance of the officer also increases. The improvement of situation awareness is done by increasing the knowledge of the technician with special orientation and training and is associated with the attachment of work to all laboratory technicians regarding the various environment around the laboratory, the various actions and risks of action, and other information that should be understood by all officers including in all services,

as well as events that may occur in the performance process of medical laboratory technician. To improve the performance of medical laboratory technician, it is necessary to increase the PsyCap which is mediated by work engagament such as regular or routine motivation to the officer with routine activity which is also done as bonding effort to laboratory officer with work environment and with co-workers.

CONCLUSION

The situation awareness and psychological capital affect the performance of laboratory technician and mediated by work engagement. So to improve the performance of medical laboratory technicians, we need to increase the knowledge of technicians about the situation awareness that can be done with a special orientation to the technicians and training. The improvement of psychological capital mediated by work engagament can be done by giving motivation routinely as effort of bonding performance of medical laboratory technician with work environment and also colleagues.

Ethical Clearance: Before conducting the data retrieval, the researchers conducted a decent test of ethics conducted at the Faculty of Public Health Airlangga University to determine that this study has met the feasibility. Information on ethical test on March 16, 2016 that the study is eligible to continue. The feasibility of the research was conducted in an effort to protect the human rights and security of research subjects.

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Yoga Interventions for Oxidative Stress and Antioxidant Status

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ABSTRACT

Purpose: The purpose of the narrative review was to examine and summarize the yoga interventions for oxidative stress. The review has included all studies done on healthy individuals and on people with different diseases with yoga as an intervention to improve the antioxidant status. **Methods:** Databases like like CINAHL, Google Scholar, Proquest and Pubmed were searched using different keywords to extract the maximum number of studies. From the obtained studies, those studies which met the inclusion criteria were analysed further to extract the data. **Results and Conclusions:** The main parameters of oxidative stress studied were malondialdehyde (MDA), NO, F2-isoprostane. The antioxidants studied were GSH, glutathione S transferase, glutathione peroxidase, Vitamin C, vitamin E, superoxide dismutase, phospholipase A2 - PLA2 and protein oxidation.

Keywords: *oxidative stress, yoga, glutathione, antioxidants*

INTRODUCTION

Oxidative stress is a result of excess free radicals over antioxidants inside the cells. Oxidation of lipids and proteins on the cell membrane and the mutation of the deoxyribonucleic acids inside the nucleus and the mitochondria are the effects of excess free radicals. [1]

This review examines the yoga interventions to reduce oxidative stress and improve antioxidants in normal healthy population as well as in patients with various diseases. An extensive search was made in databases like CINAHL, Google Scholar, Proquest and and Pubmed for articles published during the last ten years using the abovementioned keywords. There were a total of 7242 articles of which 7215 were excluded for not qualifying the inclusion criteria or because they were repeated in different databases. The findings of the remaining 27 studies are summarised under different headings below.

Malondialdehyde (MDA):

Peroxidation of polyunsaturated fatty acids results in the formation of reactive aldehydes like Malondialdehyde (MDA). The level of MDA is directly related to the concentration of free radicals and is a marker of oxidative stress. The increased level of MDA is not considered healthy as it promotes destruction of proteins and DNA by a chain of cellular reactions. [2]

Studies which have assessed the effect of yoga on oxidative stress have used MDA as a marker. A study done among the healthy Sudarshan kriya practitioners has showed a 12% reduction in the level of MDA among the participants. Sudarshan kriya is a form of yoga propagated by the Art of Living Foundation. [3] In another study done in Korea among young university students, yoga practice has resulted in a reduction in MDA of about 0.7-fold than that of the baseline value. [4] Not only in young healthy students, but among healthy elderly subjects also yoga has brought about favorable changes. The level of MDA (m mol/ml) was reduced from 5.28±0.52 to 4.48± 0.69 among elderly from Uttar Pradesh, India, after they practiced Nadi shodan pranayama. [5] The practice of yogasanas and pranayama resulted in a decrease in the level of MDA (µmol/L) from 42.2 ± 10.0 (36.0—48.0) to 37.3 ± 6.7 (33.5—41.2) among pre-diabetics. [6] A study conducted by the same authors among diabetics has shown that the level of MDA was reduced 20% among patients who performed yoga. These patients also practiced yogasanas, pranayama and shavasana. [7] Another study among people with diabetes has reported that yoga practice has resulted in 19.9% reduction in the level of MDA among diabetics. [8] Diabetes and hypertension

are two most common life style related diseases which are on the increase worldwide. Apart from diabetics, yoga practice has shown to reduce the level of MDA ((nmol/L)) from 3.148 ± 0.573 to 2.481 ± 0.776 among people with hypertension also. [9] As reported by Patil in 2014, MDA was significantly reduced in elderly male individuals with Grade-I hypertension after practice of yoga. [10] The effect of yoga on obesity was demonstrated as well. Yoga practice has significantly reduced MDA among obese individuals. [11] End-stage renal disease (ESRD) patients are known to have very high level of oxidative stress. Even in such patients, it is astounding to note that yoga exercise has resulted in a 4.0% reduction in MDA. [12] Though heart failure is a chronic progressive illness, yoga has shown to reduce MDA level among patients with heart failure. MDA level came down from 11.98 uM ± 5.26 to 4.30 uM ± 1.87 among those who practiced yoga. [13] Vandavasi claims that yoga practice has caused an improvement in MDA levels among healthy adults [14] Power fitness yoga training among twelve healthy post menopausal women who attended yoga did not show any change in malondialdehyde. [15] Another study conducted in 2003 also did not find any changes in the level of MDA among patients (22) with coronary artery disease (CAD) after an intensive lifestyle modification. [16]

The above mentioned studies were done on different types of participants; healthy as well as people suffering from different illnesses. The yoga interventions and the duration of the program was also varied. Majority reported that yoga was helpful in reducing the level of MDA. Though different studies have used different ways of interpreting, the reduction in the level of MDA among yoga practitioners can be looked at as an indicator of reduced oxidative stress.

Summary Findings of Malondialdehyde:

Participants	Yoga Program	Duration	MDA level difference
40 male and female volunteers	Sudarshan kriya yoga	2 months	12% reduction
30 university students	Asanas, pranayama	90 minutes a week for 12 weeks.	0.7-fold reduction
74 healthy elderly subjects	Nadi Shodhan Pranayama	20 minutes, per day for 6 days a week for 3 months	5.28±0.52 m mol/ml to 4.48± 0.69 m mol/ml
29 Pre-diabetics	Asanas, pranayama and shavasana.	75—90 min/day, 5 days a week for 3-months.	42.2 ± 10.0 to 37.3 ± 6.7 (μmol/L)
123 Type 2 diabetic patients	Asanas, pranayama and shavasana	3 days/week for 3 months.	53.0 ± 11.3 to 42.2 ± 9.9 (μmol/L)
77 Type 2 diabetic patients	Asanas, pranayamas, warm-up exercises and savasana	24 weeks	2.36 ± 0.20 to 1.89 ± 0.16
30 adults with hypertension	Asanas and pranayama	50–60 minutes per day for 42 days	3.148 ± 0.573 to 2.481 ± 0.776
28 elderly with hypertension	Asanas and pranayama	One hour daily, 6 days a week for three months	Significant reduction (p=0.04)
40 obese individuals	Asanas and pranayama	One hour daily, 6 days a week for one month	Significant reduction (p=0.000)
33 adults with ESRD	Hatha yoga	One hour of hatha yoga for four months	2.26 nmol/L to 2.17 nmol/L
65 adults with heart failure	Asanas and pranayama	60 minutes per day for 12 weeks	11.98 uM ± 5.26 to 4.30 uM ± 1.87
30 healthy adults	Asanas and pranayama	One hour per day, 5 days per week for 12 weeks	253.12 ± 21.74 nmol% to 180.30 ± 20.15 nmol%

Nitric oxide:

Nitric oxide (NO) is a free radical generated inside the cells as a result of metabolism of nitrogenous products. In moderate amounts, NO has a positive role in blood pressure regulation, communication between neurons and immune response. [17] [18] If produced in excess or produced with ROS concurrently, NO can cause toxic effects. [19]

In Lim & Cheong's study, there was a decrease by 0.6 fold of nitric oxide (NO) among university students who practiced yoga. [4]

F2-isoprostane:

The isoprostanes are the products formed as a result of arachidonic acid peroxidation. They are thought to be involved in the oxidant injury of various diseases including atherosclerosis, Alzheimer's disease and pulmonary disorders. In Lim & Cheong's study, F2-isoprostane among university students was decreased by 0.7 fold. [4]

Glutathione:

Glutathione donates electron to reduce disulfide bonds within the cytoplasmic protein and gets oxidized to glutathione disulfide. [20] The endogenous cellular antioxidant defences are maintained by the glutathione system. [21] Glutathione and its redox system enzymes, glutathione peroxidase and reductase, provide a protection system from oxidative damage. [22]

The activity of GSH was increased by 2.1 fold among university students who practiced yoga. [4] Glutathione increased from 235.3 + 16.9 nmol/L to 331.7 + 37.6 nmol/L among male volunteers of Indian navy who practiced yoga. The ratio of GSH/GSSG was raised from 0.88 + 0.02 to 1.34 + 0.04 in the yoga group. [23] Serum GSH has significantly increased among people with hypertension also who practiced yoga. [10] Reduced glutathione, was increased significantly following yogic practice among the male volunteers of Air Force Academy as well. [24]

In Bhatnagar's study, lifestyle modifications including Nadi shodana pranayama for twenty minutes have resulted in significant increase of GSH from 88.03±9.58 ng/ml to 93.12±9.17 ng/ml. [5] Contrary to these findings, 12 weeks of moderate intensity power fitness yoga training in postmenopausal women did not result in any change in the values of GSH. [15]

Intensive lifestyle modification among 22 CAD patients for four months resulted in statistically significant increase in erythrocyte glutathione (GSH). [16] There was no significant difference in glutathione among pre-diabetics who practiced yoga whereas another study by the same authors among diabetics showed significant improvements in glutathione. [6]

Glutathione S transferase:

Glutathione S transferase is a family of enzymes that catalyzes the conjugation of reduced glutathione (GSH) to various substrates thereby protecting the cells from free radical attack. [25]

There was a slight increase in the glutathione S transferase activity among university students who practiced yoga. [4] Among newly diagnosed hypertensive adults who practiced yoga, there was an increase in glutathione S transferase from 0.923 ± 0.198 to 1.038 ± 0.142. [9] Male volunteers from Air Force Academy who practiced yoga also showed significant increase in the activity of glutathione S-transferase. [24]

Glutathione peroxidase:

Glutathione peroxidase detoxifies peroxides in living cells thereby inhibiting the formation of free radicals. [26]

Yoga has resulted in 1.9 fold increase of glutathione peroxidase activity among healthy university students. [4] Twelve weeks of power fitness yoga training among the postmenopausal women resulted in significantly increased activity of glutathione peroxidase (GPx). [15] Its activity was significantly lowered in CAD patients who was performing yoga. [27]

Vitamin C:

In a pilot study among pre-diabetics, there was no difference in the level of Vitamin C (μmol/L) 27.3 ± 13.6 vs. 27.3 ± 14.8. [6] In another report, by the same authors, involving 123 diabetic patients it was reported that there were significant improvements in the levels of vitamin C at three months. [7]

Among elderly male participants with hypertension, yoga practice for three months has significantly enhanced the levels of vitamin C. [10] Vitamin C increased significantly following yogic practice among volunteers

of Air Force Academy as well. [24]

Vitamin E:

Pilot study among pre-diabetics showed no significant difference in the level of vitamin E (µmol/L) 57.6 ± 16.0 vs. 52.5 ± 14.2 [6] whereas yoga exercise for four months has resulted in significant increase in plasma vitamin E among people with CAD. [16] Male volunteers of Air Force Academy who practiced yoga also showed significant increase in vitamin E. [24]

Superoxide dismutase:

Superoxide dismutases are found in three isoforms; the cytoplasmic Cu/ZnSOD, the mitochondrial MnSOD, and the extracellular Cu/ZnSOD. The conversion of O2•− H_2O_2 is catalyzed by SOD. Excess of nitric oxide is inactivated by SOD thereby preventing oxidative damage caused by NO. Sudarshan Kriya resulted in 27% increase in the level of superoxide dismutase among volunteers. [3] There was no significant difference in Superoxide dismutase (unit/gmHb) 4721.0 ± 1263.0 (3992.0—5450) vs. 4340.0 ± 978.0 (3776.0—4905.0) among pre-diabetcis. [6]

The level of superoxide dismutase was elevated among elderly male individuals with Grade-I hypertension, who practised yoga. [10] There was significantly elevated activity of SOD among patients with CAD who practiced pranayama. [27] SOD was significantly elevated among normal adult males as well. [24] [28] 12-weeks of power fitness yoga training among postmenopausal women showed significant increase in the concentration of Superoxide dismutase (SOD) [15].

In another study done in Cuba, 24.08% increase in the activity of SOD was observed among diabetic patients who practiced hatha yoga. [8] Even in patients with end stage renal disease, the Hatha yoga exercise has resulted in increased activity of SOD from 12.91 ± 0.17 U / L to 13.54 ± 0.15 U / L [12]

Phospholipase A2 - PLA2:

Arachidonic acid is a metabolic precursor of eicosanoids. Phospholipase A2 (PLA2) catalyzes the release of arachidonic acid from membrane phospholipids. Mitochondrial sPLA2 interrupts the mitochondrial respiratory chain and escalates the release of free radicals. Oxidative metabolism of arachidonic acid also generates ROS. In a study done in Cuba, the authors reported there was a 7.1% increase in phospholipase A2 - PLA2 activity among diabetics who practiced hatha yoga. [8] There was a significant reduction in the activity of PLA from 2.68 ± 0.02 IU / L to 2.34 IU / L among people with end stage renal disease who practiced hatha yoga. [12]

CONCLUSION

The main parameters of oxidative stress studied were malondialdehyde (MDA), NO, F2-isoprostane. The antioxidants studied were GSH, glutathione S transferase, glutathione peroxidase, Vitamin C, vitamin E, superoxide dismutase, phospholipase A2 - PLA2 and protein oxidation. Many studies have reported that the markers of oxidative stress were decreased and antioxidants were increased after practicing yoga.

Ethical Clearance was not obtained as this is a review article.

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Conflict of Interest - Nil

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Intermittent Hypoxia-Hyperoxia Exposures Improve Cardiometabolic Profile, Exercise Tolerance and Quality of Life: A Preliminary Study in Cardiac Patients

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ABSTRACT

Study design: randomized controlled before-and-after and in follow-up trial. Forty-six CAD patients volunteered to take part in the study: a group of 27 patients undertook an Intermittent Hypoxia (O_2 at 10%) - Hyperoxia (O_2 at 30%) Training (IHHT), while a control group (CTRL) of 19 patients was allocated to sham IHHT treatment (breathing via face mask by room air, O_2 at 21%). Exercise performance, blood and metabolic profile, quality of life (MOS SF-36, Seattle Angina Questionnaire, SAQ) were measured before and after IHHT/sham IHHT in both groups; the intervention group was also assessed one month after completing the IHHT.

The IHHT intervention group showed improved exercise capacity (+1,8 ml O_2/min/kg, p=0,02), reduced resting systolic and diastolic blood pressures (151/85 before vs 130/73 after p<0,01), enhanced Left Ventricle Ejection Fraction (62,6±5,5% vs 58±6,2%, p<0,01), glycemia was significantly reduced only at 1-month follow-up (6,18±1,7 after vs 7,10±2,34 mmol/l at baseline, p=0,037). Frequency of angina as reason to stop exercising was significantly reduced after treatment and at 1-month follow-up.

In CAD patients an Intermittent Hypoxia-Hyperoxia Training program is associated with improved exercise tolerance, risks factors profile and quality of life (SF-36, SAQ). IHHT has proved to be safe, well tolerable and easily applicable in cardiac patients.

Keywords: *Intermittent hypoxia-hyperoxia training, exercise tolerance, cardiometabolic profile, coronary artery disease, quality of life, cardiac rehabilitation*

INTRODUCTION

In recent years, the structure of cardiac rehab methods is expanding due to the combined use (along with individually adjusted exercise training) of new high-tech instrumental techniques - enhanced external counterpulsation, extracorporeal shock wave therapy, etc. One of the promising approaches is the use of repeated multiple episodes of adaptation to hypoxia - interval hypoxic training (IHT).

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Intermittent exposure to normobaric hypoxia (IHT) has been shown to improve exercise capacity without exercising in the elderly and in cardiac patients [2,3]. IHT also positively affects the Autonomic Nervous System and pulmonary functioning in various patients [4]. This technique consists of intermittent exposures to hypoxic and normoxic stimuli through a face mask (one cycle of up to 5 hypoxic exposure lasting at least 5–6 min, and being followed by at least 5–6 min of normoxic air breathing) repeated almost daily (4-5 days a week) over 2–3 weeks [2].

In our study we used normobaric Intermittent Hypoxic-Hyperoxic Training (IHHT) as a new alternative treatment, more effective than adaptation to interval hypoxia-normoxia: replacing normoxia with hyperoxia

during intermittent exposures to hypoxia produces a faster membrane-stabilizing effect in cells of the heart, liver, and brain compared to IHT in experimental research of T.Sazontova et al [8]. During periods of the induced hyperoxia, the induction of reactive oxygen species (ROS), which is necessary to start the cascade of the redox signaling pathways, takes place, which leads to enhanced synthesis of protective intracellular protein molecules, mainly with antioxidant function (antioxidant defense enzymes, iron-binding proteins, heat shock proteins etc.) [7]. IHHT has been proven to be effective and better tolerable in preliminary studies focused on exercise performance [5]. Very recent studies reported that IHHT improved exercise performance in athletes with overtraining syndrome [10], contributed significantly to improvements in cognitive function and functional exercise capacity in multi-morbid geriatric patients [1].

We aimed to conduct a controlled trial to investigate the effects of an IHHT program on exercise tolerance, cardio-metabolic risk-factors and patient-relevant subjective parameters of life quality assessment in CAD patients.

METHOD

Population

Fifty-four patients with diagnosis of CAD (NYHA functional class II and III) in stable clinical condition for the last six months were invited to participate in the study.

Twenty-seven patients were people waiting to start a usual cardiac rehabilitation program and they were allocated to IHHT group. Twenty-seven patients were allocated to control/sham-IHHT group (CTRL), but eight of them dropped out before initial baseline assessment, so that only 19 patients volunteered as controlled group. Participants' drugs plan was unchanged during the entire study period (drugs used by participants included beta-blockers, calcium channel blockers, ACE-inhibitors, ATR-blockers, anti-aggregants, statins, nitrates and diuretics). All participants were blinded to group allocation. Participants were also advised not to change nutrition and levels of daily physical activity during the study.

Exclusion criteria were: history of exercise induced syncope, NYHA class IV, decompensated heart failure, severe angina, grade 3 hypertension at rest (SBP >180 and/or DBP >110 mmHg).

Intervention

Participants in the intervention group undertook a program of Interval Hypoxia-Hyperoxia Training (IHHT) consisting of personalized repeated exposures to hypoxia (breezing through a face mask by gas mixture with 10–12% O_2) and to hyperoxia (30–35% O_2): 3 sessions a week, 5-7 hypoxic periods lasting 4–6 min, with 3-min hyperoxic recovery intervals for 15 sessions in total (ReOxy-Cardio, AiMediq, Luxembourg). This program was based on a 10-min continuous hypoxia test and tailored on individual responses to hypoxia exposure according to previously published principles and protocols guiding the clinical use of intermittent hypoxia exposure (9, 21). Participants in the control group completed a sham program breathing room air (normobaric normoxic mixture following the same schedule of the IHHT group), so completing at least 15 daily sessions over three weeks, each session including up to seven normoxia-normoxia cycles of up to 6 minutes of sham exposure and 3 minutes sham recovery between periods of sham exposure. During each session of both the IHHT and sham IHHT treatments all participants were continuously monitored (blinded) using fingertip pulseoxymeter (pulse rate and SaO_2) and supervised by physicians and/or nurses. Blood pressure measurements where performed before and after each session.

Study protocol

Baseline assessment included:

- Anthropometrics (height, weight, BMI, Seca stadiometer, Vogel & Halke, Germany),
- Resting blood pressure and heart rate (Omron; Omron Healthcare, Japan);
- Cardiopulmonary stress test (Cardiovit AT-104 PC Ergo-Spiro, Switzerland). A six-lead electrocardiogram was recorded continuously. The selected exertion protocols were Bruce and Modified Bruce depending on patients' clinical conditions. Peak oxygen uptake (VO_2 peak) was defined as the highest 15-s average of oxygen uptake obtained at the end of the test (i.e. at the highest mechanical output achieved). Test was stopped according to internationally agreed criteria (8). Blood pressure, and Ratings of Perceived intensity

of Exertion according to the Borg scale were determined at the end of each workload;

- Echocardiographic study in M-mode (ESAOTE Mylab Alpha) was conducted before starting the program and within one week after completing the program;

- Blood samples (fasting): Red and white blood cell count, haemoglobin concentration, reticulocytes, serum total and high density lipoprotein (HDL) cholesterol, triglycerides and glucose concentrations were analyzed by the central biochemical laboratory of our University (I.M. Sechenov Moscow State Medical University) using standardized analytical methods on fasting blood samples;

- Health related quality of Life (HRQoL) was tested by the Medical Outcomes Study 36-item Short Form Health Survey (MOS SF-36), one of the most often-used generic instruments to measure HRQoL in cardiac populations (23) and is reported to be the most appropriate in its validity, reliability, and sensitivity. Russian version of the SF-36 Health Survey was used in the study and reflects the eight scales: physical functioning, role-physical, bodily pain, general health, vitality, social functioning, role-emotional and mental health (5)

- Additionally HRQoL was monitored by disease-specific survey - Seattle Angina Questionnaire SAQ, (22).

All assessments were repeated 3 days (range 2–5 days) after completion of the IHHT program (or sham program in control group) and at 1-month follow-up (only in IHHT group).

Data analysis

Statistical analyses were performed using SAS statistical software version 9.3 for Windows (SAS Institute Inc, Cary, USA). All data are reported as Mean±SD and statistical significance was at $p<0.05$. After testing for normality by Shapiro-Wilk test, Student's paired t-test or Wilcoxon's signed rank test were used to compare values before and following the IHHT program. Also comparisons were performed between IHHT and Control groups at same time points.

The study was approved by the Ethical Committee of I.M. Sechenov Moscow State Medical University and carried out in conformity with the ethical standards laid down in the Declaration of Helsinki-Ethical Principles for Medical Research Involving Human Subjects (Bulletin of World Health Organization 2001). Written informed consent was obtained from all participants.

RESULTS

Primary outcome was exercise tolerance measured as stress test response and aerobic capacity (Bruce and modified Bruce incremental workload tests protocols and indirect calorimetry). Secondary outcomes were patient-centered (Health related quality of Life (HRQoL) assessed by MOS SF-36 and Seattle Angina Questionnaire, [20,21]) and clinically relevant to better manage CAD (blood pressure, lipid profile, glycemia, Left Ventricular Ejection Fraction, LVEF).

Eight patients in the control group withdrew before baseline assessment. All the patients allocated in the IHHT group completed the program and were tested before and after the IHHT and at 1-month follow-up. Characteristics of the participants are shown in Table 1. In the control group only 19 participants (out of 27 initially recruited) made themselves available to be assessed before starting and after the sham program.

Cardiovascular adaptations

At baseline, control group showed significantly ($p<0.05$) lower Blood Pressure values (SBP 131±18 vs 151±19 mmHg, DBP 78±10 vs 85±11 mmHg), higher aerobic capacity (16.8 ± 3.9 vs 14.25 ± 4.2 mlO_2/min/kg measured as VO_{2peak} using modified Bruce and Bruce protocols depending on patients' clinical conditions). These findings were somewhat unexpected and were explained by less pronounced CAD and Heart Failure symptoms and better medication in the control group, allocated later to sham treatment.

Table 2 summarizes cardiovascular responses after IHHT (stress test according to Bruce and modified Bruce protocols, VO_{2peak} measurement using indirect calorimetry and gas analysis, Resting Systolic and Diastolic Blood Pressure, Resting and maximal effort Heart Rates, Left Ventricle Ejection Fraction): The IHHT group showed after treatments and at follow-up lower frequency of 'angina as reason to stop exercising', significant increase in aerobic capacity, lowering in resting systolic and diastolic blood pressure, resting heart rate and improved myocardial performance. No significant changes have been observed in CTRL.

Blood biochemistry

Table 3 shows relevant blood biochemistry and hematological parameters (Hemoglobin and Reticulocytes, Total Cholesterol and Low-Density Lipoproteins, Glycemia). Lipid profile improved as well as the Atherogenic Index, mainly because of a significantly lowered Total Cholesterol. In IHHT group hemoglobin and glycemia were unchanged after IHHT, but glycemia was significantly lower at 1-month follow-up. No significant hematological changes have been revealed in CTRL.

DISCUSSION

Our results show that, after 15 daily session of IHHT, cardiopulmonary fitness was significantly improved as the values of VO_{2peak} were higher than those measured at baseline. These values are not likely to be clinically meaningful as their magnitude is around 0.5 METS but they show that improving cardiopulmonary fitness without exercising is feasible in patients with very low baseline values and co-morbidities. Linked to this it is worth putting emphasis on the significant reduction of the number of patients reporting angina as a reason to stop exercising while undertaking a stress test. Our results are aligned with previous studies on Intermittent Hypoxia-Normoxia exposure in different forms: Intermittent Hypoxia Training (breathing hypoxic mixtures via a facial mask while resting, usually comfortably sitting) and Training in Hypoxia (continuous exposure to hypobaric or normobaric hypoxia while exercising). Both these "strategies" have been shown to be effective in improving exercise tolerance and performance in athletes by triggering hematological and non-hematological adaptations [6].

Table 1. Descriptive statistics at baseline of the IHHT and Control groups.

	IHHT group (n=27)	Control group (n=19)
Males n (%)	9 (33%)	9 (47%)
Average age, years (range)	63,9 (52-77)	63,2 (43-83)
Body mass (kg)	81,6 ± 13, 9	79,1 ± 12,5
Heart Rate (bpm)	71,5 ± 11,4	68,9 ± 9,6
Systolic Blood Pressure (SBP, mmHg)	151 ± 19	131 ± 18
Diastolic Blood Pressure (DBP, mmHg)	85 ± 11	78 ± 10 (p=0,05)
Current smokers, n (%)	5 (18,5%)	4 (18,5%)
Hypertension, n (%)	22 (81,5%)	17 (89,5%)
Diabetes, n (%)	8 (29,6%)	3 (15,8%) (p=0,04)
Exertional Angina, II FC	20 (74,1%)	17 (89,5%)
Exertional Angina, III FC	7 (25,9%)	2 (10,5%) (p=0,04)
Previous MI, n (%)	8 (29,6%)	8 (42,1%)
Paroxismal AF, n (%)	5 (18,5%)	2 (10,5%)
COPD, n (%)	2 (7,4%)	2 (10,5%)
VO_2 peak (ml/min/kg)	14,3 ± 4,2	16,5 ± 4,2 (p=0,05)
LV Ejection fraction (%)	58,0 ± 6,2	62,2 ± 7,2

Table 2. Cardiovascular responses and haemodynamic parameters of the IHHT and the control groups before and after the program and at 1-month follow-up (in IHHT group only)

	Group	Before (HT1)	After (HT2)	1 Month follow up (HT3)
Angina as a reason to stop test, n (%)	IHHT	12 (44,44%)	6 (22,22%)*	3 (11,11%)**
	Control	4 (21,05%)	6 (31,57%)	---
Exercise time, s (M-BRUCE)	IHHT (n=13)	354 ± 194	383 ± 141	395 ± 130** p=0,01
	Control (n=5)	280 ± 92	323 ± 64 # p=0,02	---

***Cont...* Table 2. Cardiovascular responses and haemodynamic parameters of the IHHT and the control groups before and after the program and at 1-month follow-up (in IHHT group only)**

Exercise time, s (BRUCE)	IHHT (n=14)	280 ± 126	295 ± 79	332 ± 113** p=0,01
	Control (n=14)	335 ± 121	355 ± 96	---
VO_{2peak} (mlO_2/min/kg)	IHHT	14,3 ± 4,2	16,1 ± 4,2* p=0,02	15,4 ± 4,5** p=0,03
	Control	16,8 ± 3,9 #	17,8 ± 4,9	---
SBP, mmHg	IHHT	151 ± 19	130 ± 13* p=0,0001	129 ± 11** p=0,005
	Controls	131 ± 18 #	131 ± 17	---
DBP, mmHg	IHHT	85 ± 11	73 ± 7* p=0,0002	75 ± 9** p=0,002
	Controls	78 ± 10 #	79 ± 10	---
Heart Rate at rest (bpm)	IHHT	71,5 ± 11,4	67,7 ± 8,3* p=0,03	66,6 ± 10,0** p=0,02
	Controls	68,9 ± 9,6	66,8 ± 10,2	---
Heart Rate Max (bpm)	IHHT	122 ± 19	120 ± 14* p=0,03	116 ± 14** p=0,01
	Control	124 ± 13	119 ± 17	---
Left Ventricle Ejection Fraction %	IHHT	58,0 ± 6,2	62,6 ± 5,5* p=0,0008	61,6 ± 6,3*** p=0,007
	Controls	62,2 ± 7,2 #	61,3 ± 6,0	---

p-values for differences between:

* HT1 and HT2, ** HT1 and HT3 *** HT2 and HT3; # - IHHT and Control group at same time point.

Table 3. Hematological and metabolic variables of the IHHT and the control groups before and after the program and at 1-month follow-up (in IHHT group only)

	Group	Before (HT1)	After (HT2)	1 Months Follow-up (HT3)
Hemoglobin, g/L Reticulocytes, %o Total Cholesterol, (TCh), Mmol/L	IHHT	134 ± 12	136 ± 13	136 ± 12
	Controls	145 ± 10	145 ± 10	---
	IHHT	9,0 ± 5,5	11,3 ± 6,2* p=0,02	9,2 ± 4,8
	Controls	6,4 ± 3,6	5,11 ± 3,13	---
	IHHT	5,6 ± 1,4	5,1 ± 1,2* p=0,041	5,5 ± 1,4
	Controls	5,5 ± 0,9	5,6 ± 1,0#	---

***Cont...* Table 3. Hematological and metabolic variables of the IHHT and the control groups before and after the program and at 1-month follow-up (in IHHT group only)**

Low-density lipoproteins (LDL), Mmol/L	IHHT	3,5 ± 1,2	3,2 ± 0,9* p=0,006	2,6 ± 1,3*** p=0,007
	Controls	3,6 ± 0,8	3,5 ± 0,8	---
Atherogenic Index (TCh - HDL) / HDL	IHHT	4,7 ± 1,8	3,4 ± 1,3* p=0,0018	3,5 ± 1,5** p=0,002
	Controls	3,6 ± 1,1	3,4 ± 1,0	---
Glucose, mmol/L	IHHT	7,10 ± 2,3	6,45 ± 1,7	6,18 ± 1,7** p=0,037
	Controls	5,83 ± 0,65	5,97 ± 0,68	---

p-values for differences between:

* HT1 and HT2, ** HT1 and HT3 *** HT2 and HT3;
# - IHHT and Control group at same time point.

CONCLUSION

A novel modality of intermitted hypoxic repeated preconditioning - interval hypoxic-hyperoxic training (IHHT) has been tested and found to be safe, deliverable to cardiac patients and associated with improved exercise tolerance, a more protective cardio-metabolic profile and superior quality of life self-assessment.

Positive multiple effects of IHHT in correction of cardio-metabolic risk factors and quality of life subjective assessments in patients with stable angina raise the prospect of potential using IHHT as an additional method of treatment and rehab of CAD patients with metabolic syndrome, as well as with orthopedic comorbidity and low adherence to exercise training.

These very encouraging results should be confirmed by randomized, well controlled trials. Further research is also needed to explain the mechanisms behind adaptations to IHHT and to better tailor individual exposures to Hypoxia – Hyperoxia cycles.

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Comparative Analysis of Conceptual Models of Social Anxiety Disorder

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ABSTRACT

Social anxiety disorder is a common mental disorder in Western Europe. It is therefore necessary to determine the specificity of mechanisms of disorders studied in different approaches.

The investigation is based on the theory of the analysis of the syndrome in pathopsychology associated with the study of social anxiety. We theoretically compared different conceptual models, define their effectiveness in diagnosis and practice of psychological intervention.

The authors demonstrated pathopsychological mechanisms related to SAD origin and development shows the effectiveness of pathopsychological approach in diagnostics and therapy. Analyzing the pathopsychological approach, we revealed that the key mechanisms, which cause SAD, are specific disturbances of target regulation of mental activity and mediation of anxiety during evaluation, changes in the "motive-goalmeans" system, social behavior aberrations and distortion of selectivity in mental activity. The comparative analysis revealed that maximum diagnostic and therapeutic efficacy is achieved during combined application of the models in the psychological practice. Along with specific features of each approach, all SAD models contain similar views on the most important mechanism of SAD development - specific partiality, selectivity of mental activity, cognitive and perceptual distortion, disturbance of the general focus of attention.

Based on our model pathopsychological it was formed mechanism of regulation of mental activity that will allow people with social anxiety disorder to adapt in society. We believe that this is necessary to form the individual goal-setting system and stabilize self-esteem, regardless of previous success \ failure.

Keywords: *SAD models, Social anxiety, Attention selectivity (vigilance), Attention self-focus, Pathopsychological model of social anxiety, mental disorder.*

INTRODUCTION

Social anxiety disorder (SAD), or social phobia, presents a mental disorder, which was fully identified at the end of the 1960s, published in the DSM - III in 1980, in the ICD-10 - in 1990 (F40.1). The DSM-IV interprets this phenomenon as a social anxiety disorder; ICD-10 interprets it as a social phobia. Despite the fact that SAD was considered a mental illness quite recently, description of this syndrome existed in ancient times. The key feature of this mental disorder is that individuals with SAD experience subjectively unbearable fear in potentially evaluative situations. There are no rational signs of danger for the individual in reality, or they are greatly exaggerated. SAD is one of the most widespread disorders in the western society, after depression and alcoholism. From 7 to 16% of the population in modern Western society may have SAD symptoms. Most often, SAD symptoms start in childhood or in early adolescence. The occurrence between men and women is approximately the same[10].

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Pathopsychology proposed and developed B.V. Zeigarnik on the basis of cultural-activity approach[6.19]. The studies, devoted to SAD severity within young people aged between 16 and 22 (1500 persons, studied in 2013-2014), residing on the territory of Altai Krai (Russia), carried out using a Questionnaire on social anxiety and social phobia[15.16], as well as through a number of other diagnostic tools, showed the following results. Most participants have strong social and initiative skills, and they are not inclined to worry about "inadequate" anxiety manifestations in appraisal situations, they use flexible strategies to overcome difficulties in situations of failure[13]. The age of 16-17 is the most vulnerable to auto-aggressive tendencies in SAD cases, communication experience of individuals aged 18-19 allows efficient management of their emotions and behavior[16].

MATERIAL AND METHOD

We have examined the specific mechanisms of SAD in cognitive, pathopsychological approaches and comparative analysis of different models SAD.

The key research method is a comparative analysis of the theoretical and conceptual models related to SAD and social anxiety. We used the theoretical analysis of performance and features (similarities and differences) of psychological mechanisms that determine SAD by the example of cognitive, metacognitive and pathopsychological approach.

We developed and tested the pathopsychological SAD model, as a tool to determine the social anxiety syndrome and to detect specifics of the main leading syndrome-forming disturbance, the structure of derivative disturbances and safe parts of mental activity at different SAD stages.

The most developed and effective are the following cognitive SAD models: Rapee and Heimberg model, the model of Mathews and Mackintosh, Clark and Wells model, the model of Carver[1.2.7.11].

RESULTS

Comparative analysis of SAD models

Social anxiety disorder develops in a specific selectivity, distortion of cognitive processes or the formation of cognitive patterns. Among all the models described the most common is the Rapee and Heimberg model, but ideas were developed in the metacognitive model of Clark and Wells allowed taking a fresh look at the treatment of emotional disorders, shifting the emphasis from teaching management of automatic cognitive phenomena to reducing management of inner phenomena.

Table 1. Comparative characteristics of the different models of social anxiety disorder.

SAD model	The Rapee and Heimberg model	The model of Mathews and Mackintosh	The Clark and Wells model	The Carver and Scheier model
Characterictics of mental activity	The "self-focused" position, typical for anxious individuals. In a social situation, constructs a mental image of what he looks like in the eyes of others, how the others view him, and then begins to behave as if he were under the close supervision of other people. Evaluate themselves "through the eyes of others" from a position of whether their self-introduction meets the expected standards.	The main violation is distortion of information in view of previous negative experiences.The person focuses on the frightening signs of situations that pose a risk of disapproval. Actualization and fixed attention on the "threat assessment system" provokes criticism risk monitoring .	Subjects perform selective processing of information and their image in the eyes others.They are focused on ourselves and negative past experiences. These subjects engaged in constant self-examination.	Person does not have the psychological ability to reduce the psychological gap between the real behavior and compliance with high standards of social behavior. Provoking negative expectations leads to more failures in problem solution.

The results of experimental studies using instrumental techniques in the methodology of cognitive and metacognitive SAD models

The general cognitive anxiety model could lead to the assumption that subjects with SAD will focus on human faces (especially with negative expression) and monitor changes in their expressions with a view to prevent the signs of disapproval. It turned out that this assumption is questionable. The socially anxious subjects simply avoid looking at others[3].

The experimental Dot Probe Task is a technique developed by MacLeod, Mathews, Tata (1986), which is widely used in studies of attention disturbances during emotional disorders[4]. Asmundson and Stein (1994) found that socially anxious subjects, in contrast to the control group, were characterized by high rate in the detection of "dots" on the screen after they have read a word that contains the meaning of "threat of assessment", regardless of dot location. Severe social anxiety cases are characterized by an increase vigilance to the surrounding stimuli and intensification of information processing in relation to the socially threatening stimuli. The research results show a big role of social stimulus (face of the other person), rather than its expression.

Table 2. The pathopsychological syndrome structure by the example of sad mental activity.

Disturbances component	**1) Goal-oriented (Organizational-regulative) – primary disturbance by social anxiety and SAD. Disturbance only in this link indicates the non-complicated SAD type.**	**2) Motivational – secondary disturbance, which matters by detecting SAD severity, is possible. Changes in this link has secondary character – the complicated SAD type.**	**3) Operational-technical (tools, operations) – the possibility of tertiary disturbance or relatively safe**	**4) Dynamic structure – possibility of derivative disturbance or relatively safe**
Characteristic of mental activity component	Characteristic of actions in terms of their regularity and organization (goalsetting, regularity and single-step execution of assignments, accountability and criticism of actions)	Personality sense of activity, achievement and avoidance motives, the adequacy of hierarchy and content of motives, the formation of new motives, mediation, stability of activity related motives.	Operational equipment of the performed mental activity (for the intellectual activity -analysis, synthesis, generalization, diversion, for attention -concentration fluctuations, etc.; for the mnestic one -storage, reproduction, remembering, and for the perceptive - constancy, categorical perception, etc.).	Analyzing the degree of flexibility, lability, rigidity, evenness / unevenness of the mental activity rate in the performance of tasks, including the implementation of activities in the assessment and communication situations.
Pathopsychological SAD syndrome	The PRIMARY syndrome-generating disturbance and basic mechanism of mental activity	The syndrome is relatively preserved. Long-term disorders cause secondary disturbance. Possible	The syndrome is relatively preserved, however, given the increased impact of emotions on the	The syndrome is relatively preserved without concomitant
	disorganization by SAD in a social situation. The impact of emotions on cognitive performance,– vulnerable self-esteem, rigid overvalued level of claims in the area of social self-presentation. The dependence of the self-esteem on appraisal / criticism.	"shift from motive to the goal" - the initial motive cannot be realized, the goal replaces motive (the motive achievement – successful information delivery is replaced by the lower level activity vector). Sense generation is internally contradictory and not always motivates to action.	the execution of operations is difficult as the tertiary (situationally occurring) disturbance. It is not the main one ("shift from goals to means" - means become the focus of attention, become "the independent" goal of psychic activity	The tertiary possible disturbance (inconsistent activity dynamics, exhaustion). Does not act as a consistent disorder, reveals itself during assessment as the "coming symptom." Resource exhaustion is caused by disruption in the multi-task environment.

Pathopsychological SAD model

Pathopsychological analysis is characterized by diagnostic value of determination of the primary, secondary, and (sometimes) tertiary component of mental activity disturbance[21,22]. Mental activity is "adjusted" in a way to the new unfavorable conditions of disease, distorting its "normal" course. The "secondary" and "tertiary" symptoms present the result of adaptation to the existing adverse conditions. Loss of any factor leads to system disruption of the entire function[9,19].

Determination of pathopsychological SAD syndrome requires qualitative analysis of the mental activity structure in the performance of cognitive tasks given the situation of varying terms ("success / failure", "criticism / appraisal") simulations related knowledge expertise, time tasks. (See Table 1).

Experimental studies have shown that SAD associated with simulations, evaluation, alternating success with failure. Patients show a high level of rigor to their sometimes causing nervous breakdowns and despair.

DISCUSSION

A number of studies devoted to selective attention in SAD cases consider *word-stimuli* containing a status threat (by their meaning) as experimental stimuli. Patients with SAD demonstrate distorted attention to the words representing "social threat", such as "stupid", "funny" or "rejection", "insolvent"[12]. Most researchers in their work use the modified Stroop test[8,18,20]. Patients with SAD indicated the color of words containing a "threat" much longer than colors of neutral words.

A group of scientists[5] outlined the main results of studies using instrumental methods for the study of cognitive processes distortion. Modern cognitive SAD models showed that fear of negative evaluation leads to increased vigilance of attention in relation to significant sources of threat. Indicators showing cognitive processes specifics during SAD (hypervigilance, threat monitoring, avoidance of direct eye contact, the speed of stimuli analysis) are considered major, as they are easily modeled and measured during watching

The majority of modern supporters of the cognitive model of mental disorders consider information processing distortions as a key factor in SAD development and maintenance. Experimental studies are based on the idea of information processing distortion. Instrumental methods give the possibility to determine, what will be in focus in evaluation situations[5,17].

One of the important results is that the main problem of social anxiety is not its severity, but the human ability to use flexible dynamic systems of mental activity regulation, mechanisms of anxiety mediation in the assessment situation. The pathopsychological SAD model shows that the situation of subjective failure by SAD is experienced as "incomplete action" concentrating motivational tension for a long time[14]. The process of structural regulation of mental activity in a social situation is possible only through active focusing on the goal image, keeping it in memory during all activities while abstracting from unimportant details[6,22]. All cognitive-perceptual processes should be viewed in accordance with the currently implemented goal aimed at breaking the distracting stimuli[13,14]. Experiments related to the pathopsychological SAD model are based on the theory of cultural-active approach related to motivational nature of the psyche. Therefore, besides direct simulation of assessment, the methods of sorting and ranking of the objects, semantic evaluation of objects and reconstruction of sense space in the assessment situations, were used[15,16].

CONCLUSIONS

The paper provides pathopsychological syndrome-oriented analysis of the social anxiety phenomenon and psychological mechanisms in these approaches.

The common pattern of all models (cognitive, metacognitive, pathopsychological) is the idea of specific selectivity of cognitive activity by SAD (specific features of memorization and reproduction of social information, the position of "multitasking" and self-perception as "an object of evaluation"), the need to work with the voluntary attention, however, using different strategies (depending on the approach).

Based on pathopsychological SAD model, we argue that the main psychological techniques related to the disorganized assessment affect, as well as to the formation of adaptive and flexible regulation of mental activity, are the following:

1) The introduction of sign-symbolic mediation of cognitive-communicative, perceptual activity in

speaking to the audience and other situations are more effective regulators than direct willpower

2) Formation of a flexible goal-setting system (the psychological distance between the immediate and longterm purposes);

3) Stabilization of self-esteem regardless of situational success / failure, forming the semantically integrated and adaptive image of success and failure, formation of positive experience in the application of adaptive tactics related to activity structuring.

4) Information of the anxiety mechanisms and training mental activity regulation along with goal priority retention, allocation of attention in the social assessment situations.

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Knowledge on Heart Smart Diet among Hypertensive Clients in Selected Urban Areas of Mangalore City

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ABSTRACT

Cardiac disease alone causes 17 million deaths per year globally. Sixty percent of world's cardiac disease cases are from India. Hypertension is one among the risk factor for cardiac disease, which cannot be cured, but can be controlled through diet and healthy life style. Many of the clients with hypertension are not following healthy diet, which will lead them to the risk of getting serious health problems. The present study aimed to measure the knowledge of clients with Hypertension on Heart Smart Diet by using Structured Knowledge Questionnaire(r= 0.87). Quantitative survey approach was adopted to accomplish the objectives. By using non-probability purposive sampling 500 samples were selected for the study. The study was conducted in various urban areas under Mangalore City Corporation. The knowledge was measured by using a structured knowledge questionnaire. The overall mean knowledge score was 20.5±1.43, with a mean percent of 60.3% revealing that the overall knowledge of the clients regarding healthy diet to prevent heart disease is moderate. So the study concluded that there is a need of interventional programmes in order to improve the knowledge of clients with hypertension regarding Heart Smart Diet.

Keywords: *Hypertension; Heart smart diet; Urban area; Clients with hypertension.*

INTRODUCTION

The human heart is a miracle organ which is about the size of a fist. It is the vital organ that starts working as soon as the 21st day of conception from mother's womb and goes on till the last breathe of life. It is the 'epicentre' of all our emotions and pumps the blood to the cells of the human body, by sleepless nights and days, which is the lifetime of the human beings. Heart helps in circulation of blood by beating approximately 70 times a minute. Coronary arteries help in supplying of blood for heart itself.[1]

"Heart diseases" is the term refers towards all the diseases of the heart and the blood vessels supplying blood to it. Different types of heart diseases are identified which varies according to the aetiology. Hypertension is one among the chronic diseases which have shown the largest decline in mortality in the past four decades. Asymptomatically itself body can be damaged severely by high blood pressure. Individuals with high blood pressure are at high risk for developing coronary artery diseases. If not treated on time it may lead to disabilities, stroke, heart attack and even death.[2]

A study of more than 20,000 male doctors for twenty years point out that heart problem can develop in a person as a result of increased weight gain secondary to the habit of a sedentary lifestyle. The study suggested that the foods that we consume in combination with daily exercises can make a huge difference in the status of cardiac health. Protein rich food items are good for cardiac health. The main food items rich in protein are vegetables, fruits, grains, nuts and seeds which help in maintaining ideal body weight and will reduce the blood pressure. Blood cholesterol levels can be reduced by consuming the unrefined whole grains with the help of fibre content in it, which also supports cardiac health.[3]

As per the report of World Health Organization, every year 17.3 million deaths occur worldwide as a result of

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cardiovascular disease alone. The report predicts that the major cause of death among human beings in future will be cardiac diseases. Physical inactivity, unhealthy diet and tobacco smoking are the major factors which leads the individual to cardiovascular diseases.[4]

Major quandary fact in heart patient's statistics is that the number of younger people is in highest percentage. A prospective study was conducted all over India concluded that people in India are at sober rate for getting the cardiac problems at their younger age itself. The study result states that as compared to the western countries Indians are not willing to take the hospital treatment for cardiac diseases quickly as possible.[5] For cardiac diseases Age-standardized Death rate in India is 405 per 100,000 people. Whereas in developed countries the rate is much lesser. Also, 22 percent of CHD-related deaths in Western countries occur in<70 years of age but in India 50% of CHD-related deaths in occur in that age group, which have to be considered seriously.[6]

NEED FOR THE STUDY

The disease rate is increasing globally in directly proportional to the increasing population rate even though people were aware about health and its dimensions. Health is considering as the fundamental right of its citizens is the newest trend among world countries. It can be achievable only through by improving the quality of human life which have to be attained by all citizens of the world.[7] High blood pressure otherwise termed as hypertension remains asymptomatically for long years which made the condition to call by the name 'Silent Killer'. The expectancy for life and the blood pressure is inversely proportional; the lower the blood pressure, the greater the expectancy for life and viceversa.[8]

A major non communicable public health problem for India and to other developing countries is high blood pressure or hypertension. It has been a significant problem and contributor to other cardiovascular diseases.[9]A study regarding the prevalence of hypertension in urban and rural residents demonstrated 29% and 25% respectively. The estimated incidence rate of high blood pressure among urban and rural population by different studies in India is 36.4% and 21.2% respectively.[10]

Hypertension is incurable but, it can be controlled. It can be controlled only through modification in lifestyle and following of rigid medication therapy. Researches shows that change in lifestyle includes modify to healthy food style and regular exercise can help to often delay and prevent or treat hypertension instead of taking anti-hypertensive drugs which are available in market. Hypertension is considered as a serious and common problem in the community, so it is necessary to create an awareness regarding this 'silent killer.' Studies shows that change in the dietary pattern will help to stop or decline the incidence of hypertension.[8]

Hypertension can be controlled through many measures. One of the important measures is the consumption of a modified diet. Research studies proved this fact. A community based experimental study was conducted among African Americans on prevention of hypertension by using modification on their diet. The objective of the study was to find out the effectiveness of change in dietary pattern on hypertension. Participants of the study were with untreated blood pressure above 160/95 mm of Hg. The study participants were put on controlled diet. The controlled diet reduced the blood pressure significantly in the total group by 11.6/5.3 mm of Hg. The controlled diet offered an alternative way to drug treatment in clients with hypertension and it may prevent hypertension if the population approach is made compulsory.[11]

The 'Heart Smart Diet' is a physician-recommended diet for people with hypertension. This modified plan of diet contains the food items which are newly added and excluded from normal daily eating menu.[12] A study conducted by National Institutes of Health has been proven to lesser the blood pressure by this modified diet. The Heart Smart Diet had various advantages over the traditional low salt (or low sodium) diet plan for hypertension. The Heart Smart Diet proved lot of other advantages to reduce blood pressure. This diet contains high fibre, potassium, calcium, and magnesium, low fat. It is also rich with fruits, vegetables and whole grains. The diet is a healthy plan, designed for the whole family.[13]

The investigator observed many people in the urban community with Hypertension. Even though they were educated they were not bothered of 'what to eat, what not to eat' in order to keep their heart safe. These clients were following hypertensive medications strictly but not practicing the modified diet plan except a reduction in salt consumption. Thus the investigator felt the need to assess the knowledge on 'Heart Smart Diet' among the clients with hypertension.

OBJECTIVES

The aim of the study was to:

- assess the knowledge on Heart Smart Diet among clients with hypertension by using structured knowledge questionnaire.

METHODS AND MATERIALS

Considering the type of the problem under the study and to meet the objective of the study, Quantitative approach found to be appropriate for the study. The setting of the study was selected urban areas at Mangalore, Dakshina Kannada, Karnataka. In view of the nature of the problem, to meet inclusion criteria like sample who were residing in the urban area, both male and female with Blood Pressure ≥ 140/90 mm of Hg and with age group 30-60 years and to achieve the aim of the study, non-probability purposive sampling was used to select the sample. The present study sample consisted of 500 clients with hypertension residing at various urban areas at Mangalore City Corporation under Surathkal PHC.

Data collection technique

In this study researcher used a reliable (r =0.87) structured knowledge questionnaire with multiple choice questions to assess the knowledge level of clients with hypertension regarding heart smart diet. The tool was validated by the experts from community medicine, community health nursing, medical-surgical nursing and from dietetics. The reliability of the tool was established by using the split half method. The correlation of the half test was found to be significant, (r½=0.71). The reliability coefficient of the whole test was then estimated by Spearman- Brown Prophecy formula (r=0.87) and found the tool was reliable. The tool consisted of two parts,

Part I: Base line data-This was planned to extract the socio-demographic data from respondents which was consisted of thirteen items.

Part II: Structured knowledge questionnaire-This was designed to elicit the knowledge of clients with hypertension regarding heart smart diet to prevent risk of Cardiac diseases, consisting of 34 items under four categories as follows.

Area I: General concepts related to heart.

Area II: Concepts related to Hypertension and Heart disease.

Area III: Concepts related to food causing Hypertension and Heart disease.

Area IV: Concepts related to dietary modifications in Hypertension to prevent the risk of Heart disease.

Table 1: Arbitrary classification of knowledge scores

Sl. No.	Score	Score (%)	Level of knowledge
1.	0 – 13	0 - 40	Inadequate
2.	14 – 24	40 – 70	Moderate
3.	25 – 34	70 – 100	Adequate

Data collection procedure

Prior to the data collection administrative permission was obtained from the District Health Officer, Mangalore and from Medical Officer, Surathkal PHC. After obtaining written consent from the subject, data was collected from them. The subjects were assured about the confidentiality and obscurity of the information which was collected from them.For maximum co-operation, the investigator introduced him to the respondents and willingness of the participants for the study was ascertained.

RESULTS

The results have been organized and presented in 2 parts:

Part I: Demographic characteristics of clients with Hypertension

Majority, 230 (46%) of the subjects were in the age group 40-49 years and only 100(20 %) were from the age group of 50-59 years. Majority, 320 (64%) of the subjects were males and 180(36%) were female. Majority, 380 (76%) of subjects belongs to Hindu religion and remaining 120 (34%) were from Muslim religion. Most, 220(44%) of the subjects were having primary education, 150(30%) were having secondary education, 80(16%) were having pre-university education, and only 50(10%) were graduates. Majority, 220 (44%) were doing private job, 150 subjects (30%) were self-employed, 80 subjects (16%) were housewives, and 50 subjects (10%) were Government employees. Majority, 220 (44%) were with

monthly income ranging from 5000 to 10,000/, and only 80 subjects (16%) were with income below 5000 per month. Majority, 300(60%) were from nuclear family and 200 (40%) were from joint family. Most, 370 (74%) were having different kinds of habits. Among the habits majority, 160 (32%) were having the habit of smoking, 150 (30%) chew tobacco, and 60 (12%) consumes alcohol and other 26% were not having any habits. Most, 350 (70%) were consuming mixed diet and 150 (30%) were consuming vegetarian diet. Majority, 350 (70%) have no information regarding dietary modifications to prevent heart disease and 150 (30%) have got information regarding dietary modification. Among 150 samples who have got information on diet modification, all the 150(100%) have health personals as the source of information.

Part II: Knowledge of clients with Hypertension regarding Heart Smart Diet

This part deals with mainly two sections they are:

Section A: Assessment of the knowledge score and Overall analysis of the knowledge scores of clients with Hypertension regarding Heart Smart Diet.

Section B: Area-wise analysis of the knowledge scores of clients with Hypertension regarding Heart Smart Diet.

Section A: Assessment of the knowledge score and Overall analysis of the knowledge scores of clients with Hypertension regarding Heart Smart Diet

Table 2: Range, frequency and percentage distribution of knowledge score regarding Heart Smart Diet among clients with Hypertension

N=500

Sl. No.	Knowledge level	Range of scores	Freq-uency	Percen-tage
1.	Inadequate	0-13	0	0
2.	Moderate	14-24	500	100
3.	Adequate	24-34	0	0

The data existing in the Table 2 reveals that all the sample (100%) in the study were having moderate knowledge regarding heart smart diet. Nobody had neither adequate nor inadequate knowledge. This indicates the need to provide adequate knowledge to the clients regarding Heart Smart Diet.

The data also shows that the overall mean knowledge score of clients were 20.5 with a mean percentage of 60.3% and SD 1.43. It also reveals that the knowledge of samples regarding Heart Smart Diet is moderate.

Section B: Area-wise analysis of the knowledge scores of clients with Hypertension regarding Heart Smart Diet

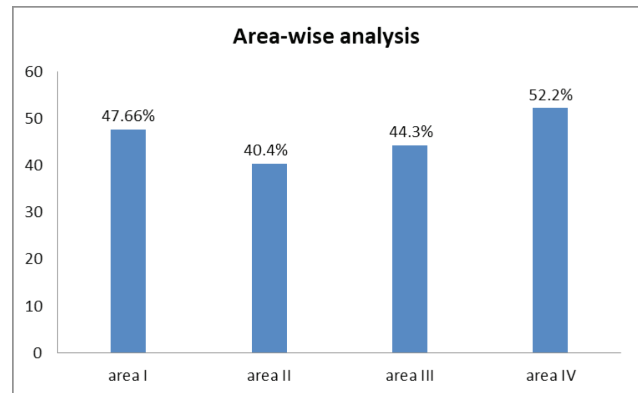

Figure 1: Bar diagram showing area-wise Mean Percentage of knowledge scores of clients with Hypertension regarding Heart Smart Diet

The data presented in the Fig 1 shows that clients with Hypertension had scored highest in the area of concept related to dietary modifications in Hypertension to prevent the risk of Heart disease (Area IV) with a mean percentage 52.2% and mean of 5.22. Next highest score is in the area of general concept related to heart (Area I) with a mean percentage of 47.66% and a mean score of 1.43. Next highest score is in the area of concept related to food causing Hypertension and Heart disease (Area III) with a mean percentage of 44.37% and a mean of 7. Subjects scored a mean least in the area of concept related to hypertension and heart disease (Area II) with a mean percentage of 40.4% and mean 2.02.

DISCUSSION

In the area of concepts related to dietary modifications in hypertension to prevent the risk of heart disease the subjects scored highest with a mean percentage of 52.2% and the subjects scored least in the area of concepts related to hypertension and heart disease with a mean percentage of 40.4%. The overall mean knowledge score was 20.5± 1.43 with a mean percent of 60.3%.

These study findings were supported by an experimental study conducted in Noida, New Delhi, to

evaluate the effectiveness of a module regarding dietary modification among clients with hypertension. The module focused on general information on hypertension, risk of clients with hypertension to get heart disease, importance of dietary modifications and exercise. The study indicated that in the knowledge scores of the clients scored (45%) less in part III area i.e. importance of dietary modifications and exercise.[14]

These present study result was supported by a survey carried down at New York to find the level of knowledge and perceptions about risk of getting heart diseases in clients with hypertension. The sample for the study was 1024, aged above 25 years. Knowledge and perceptions were evaluated by using a standard interviewer-assisted questionnaire. The study results showed that knowledge of subjects regarding the risk for getting heart disease was 40% and there is still major gap between the rates of real risk and actual risk of heart disease.[15]

CONCLUSION

The study was aimed to assess the knowledge on Heart Smart Diet among hypertensive patients of selected urban area of Mangalore city. The study result found that the clients with hypertension possess moderate knowledge regarding Heart Smart Diet and there is severe need of interventional programmes to improve the knowledge of clients on Heart Smart Diet.

Funding: This research received no grant from any funding agency.

Conflicting Interest: Author declares that there is no conflict of interest.

Ethical Clearance: Ethical clearance obtained from college ethical committee.

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Job Satisfaction of Work Life Balance of Women Employed in Unorganised Sector in Kanchipuram District, Tamilnadu

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ABSTRACT

In the construction industry around one third of the workers are women and children. Women workers are illiterate and therefore face serious work-related problems, namely wages and gender discrimination, sexual harassment, unsafe working environment etc. Despite all this, the construction industry mainly attracts women workers. Women workers skills are almost at the same level but they are not considered as such and asked to help their male co-workers. Husbands of some woman workers consume alcohol and beat them. Some woman workers develop relations with co-workers and get trapped. The women employees in kanchipuram city constitute universe for the study. The researcher has drawn 600 women employees working in construction industry in various taluk constituting 100 employees from each taluk for the purpose of the study. Data was collected with the help of a structured questionnaire and data was analyzed using statistical tools like ANOVA and Mean score. The study revealed that the levels of work-life balance of women employees in construction industry unorganised sectors of the study are significantly different.

Keywords: *Work-Life Balance, discrimination, Women Employees, construction industry.*

INTRODUCTION

Unorganized construction workers can truly be described as sweat labour, and violation of laws on minimum wages, equal wages, child labour, contract labour, interstate migrant workers etc. is rampant in construction occupations[1]. Organized sector workers are distinguished by regular salaried jobs with well-defined terms and conditions of employment, clear-cut rights and obligations and fairly comprehensive social security protection. The unorganized sector, on the other hand, has no such clear-cut employer-employee relationships and lacks most forms of social protection. Having no fixed employer, these workers are casual, contractual, migrant, home based, own-account workers who attempt to earn a living from whatever meagre assets and skills they possess.

REVIEW OF LITERATURE

Nusrat Ahmad, March, (2009). ASSOCHAM's study based on the survey of 103 corporate female employees from 72 various companies/organizations across 11 broad sectors of the economy focused on the issues of corporate female employees. One of their significant finding is that high psychological job demands like long working hours, working under deadlines, without clear direction leads 75 percent of the working females suffer depression or general anxiety disorder than those women with lowest level of psychological job demands. Risti (2009) According to his, the changed work pattern has resulted in significant pressures on social as well as family lives of the people. Organizations are now working round the clock throughout the week. Now-a-days, employees have to work in shifts, both in the morning as well as in the evening. This created the issue of work-life-balance.

Need for the Study;- In the present scenario, due to many changes happening in the work place and family systems, a vast majority of women are finding it difficult to achieve a desired Work-Life Balance. In comparison with men, women have more responsibilities at home. Though there are studies on Work Life Balance, relatively there are fewer studies on work-life balance of women employees. The studies were more confined to sectors like Unorganised Construction Industries. Therefore there is a need to study how women are balancing their work and family life in Construction Industries.

Statement of the Problem;- Nowadays more rural and urban women were going for construction works. The reason for such shift in occupation is reduced agricultural activities due to poor rainfall & cost hike. As the living cost in high to make ends meet women choose alternative jobs. She has to overcome at home, workplace, health problem, family problems, sexual harassment and social issues. The researcher has noticed many construction workers in hotspots like, various taluks in Kanchipuram District, Tamilnadu. These women seem to be in pressure to identifying the availability of works, distance to be travelled to new workplace, insecurity about work and reaching home late in evening. This influenced the researcher to do research about such women working in construction field. So, the researcher wants to study the problems faced by the construction industry employees in areas of occupation, social, family and personal aspects.

Scope of the Study;- The study which relates to the Status of Women Workers in the Unorganized Sector in Kanchipuram District covers the major six taluks of entire district. A well prepared Interview Schedule has been prepared and administered among the women employee of the unorganized sectors in the district. Both primary and secondary data have been collected and used for the purpose of the study. The study has been restricted to Alandur, Sholinganallur, Sriperumbudur, Uthirmerur, Madurantakam and Cheyyur taluks lie within the Chennai Metropolitan area taluk where the maximum number of industries employing women is available.

Research Methodology;- The study of the objectives and testing of hypothesis is dependent primarily on the reliable measurement of the variables and secondly on the methods and procedures applied for deriving conclusions.

Sample Size;- The sample size considered for the study is 600 working women employees in construction industry of unorganised sectors selected from various six taluk of Kanchipuram district, Tamilnadu and each taluk is 100 working women employees in construction industry.

Sampling Method; - Simple random sampling method is used for the present study to ensure that different strata i.e. different sectors are adequately represented in the sample.

Data Collection;- Both primary and secondary data are collected for the purpose of the study. The survey method is used to gather primary information for the study. The required data is collected from the sample respondents with the help of a questionnaire designed for the purpose and through personal interviews also. The secondary data is collected from books, journals, magazines, websites, etc.

OBJECTIVES

1. To study the impact of work life balance on job satisfaction.

2. To study the influence of demographic variables on work life balance.

3. To offer the suggestion for improving work life balance of women employees in unorganized sectors.

1. Introduction Perception towards Job satisfaction

Job satisfaction acts as an important factor that implies Work Life balance in any sector. Presence of Job satisfaction might be a key aspect to many results and it also affects other factors. In this section, the perception of women employees towards Job satisfaction in unorganised sector was studied. Nine variables, namely, (i) I am very satisfied to work as a Construction labour, (ii) I believe there is a spirit of co-operation from the team, (iii) I enjoy my relationship with my coworkers, (iv) My job is interesting and am motivated to do well, (v) My workload is reasonable and manageable, (vi) There is flexibility in working time, (vii) I am happy with the distance that I travel each day to work, (viii) Wages increment is based on performance, and (ix) My employee actively encourages healthy work-life balance were taken to measure the perception of the respondents[2]. To test the significant difference among the mean value of the variables measured against the test average response of 3 (mean score), the following null hypothesis is framed.

$H_0$1 (a): The perception level of women employed in unorganised sector towards Job satisfaction does not differ with the average score.

Table 1 shows the results of one sample t-test for studying the women employees' perception towards Job satisfaction in unorganised sector in Kanchipuram.

Table 1 Women employee's perception on Job satisfaction

Statements	Mean	SD	t-value	p-value
I am very satisfied to work as a Construction labour	3.96	1.371	16.632**	<.001
I believe there is a spirit of co-operation from the team	3.48	1.150	9.989**	<.001
I enjoy my relationship with my coworkers	3.41	1.172	8.248**	<.001
My job is interesting and am motivated to do well	2.75	1.257	4.889**	<.001
My workload is reasonable and manageable	2.69	1.378	4.215**	<.001
There is flexibility in working time	3.15	1.258	2.853**	.004
I am happy with the distance that I travel each day to work	3.23	1.234	4.412**	<.001
Wages increment is based on performance	3.28	1.249	5.309**	<.001
My employee actively encourages healthy work-life balance	2.85	1.417	3.222**	.001

** Significant at 1% level

Table-1 shows the women employees' perception towards Job satisfaction in unorganised sector in Kanchipuram. The t-values of the variables 16.632, 9.989, 8.248, 4.889, 4.215, 2.853, 4.412, 5.309 and 3.222 are significant at 1% level. This shows that there is significant difference between the mean responses given by the respondents towards Job satisfaction, the null hypothesis is rejected. Further the mean score of the variables; I am very satisfied to work as a Construction labour (3.96), I believe there is a spirit of co-operation from the team (3.48), I enjoy my relationship with my coworkers (3.41), There is flexibility in working time (3.15), I am happy with the distance that I travel each day to work (3.23), Wages increment is based on performance (3.28) are higher than the average mean score [3]. My job is interesting and am motivated to do well (2.75), My workload is reasonable and manageable (2.69), and My employee actively encourages healthy work-life balance (2.85) are significant at 5% level. This shows that the women employees are more satisfied in their job in unorganised sector in Kanchipuram.

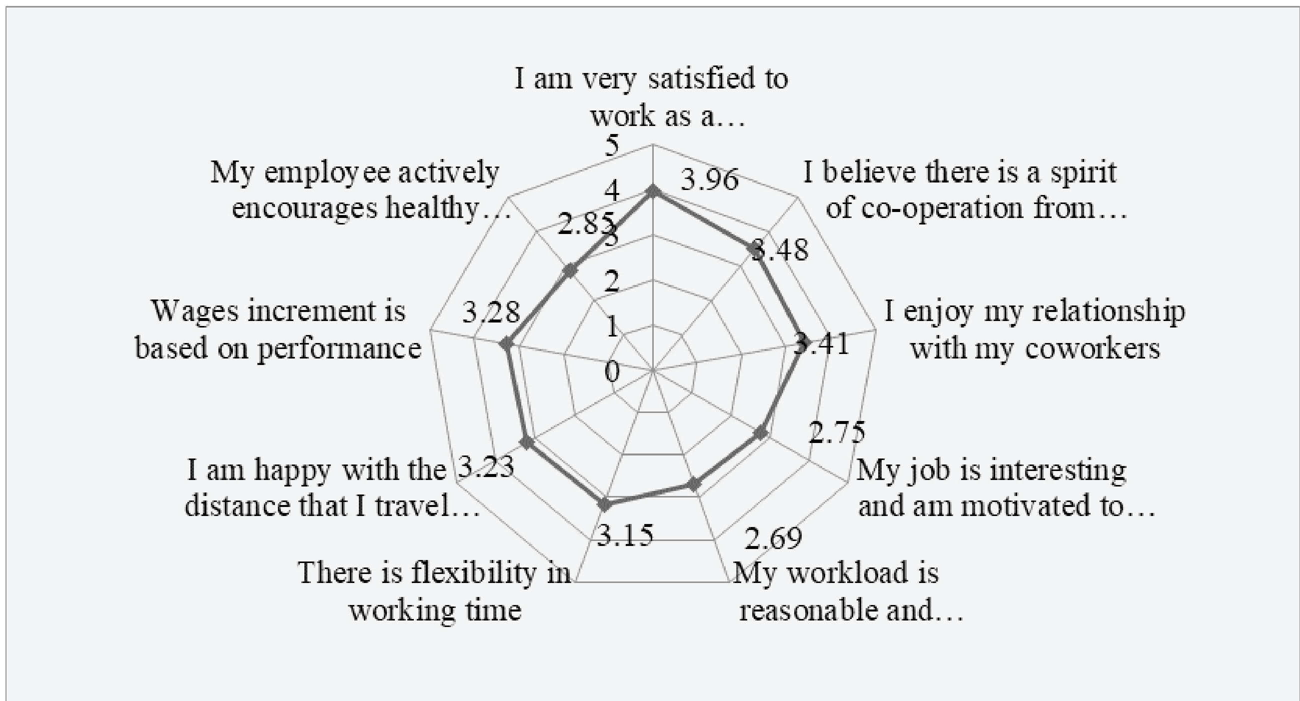

Figure 1 : Radar diagram showing the mean response for perception on Job satisfaction

2 Influence of women employee's demographic variables on Job satisfaction

To test the significant influence of demographic variables on Job satisfaction of women employed in unorganised sector in Kanchipuram, one way ANOVA is applied to assess the influence of demographic variables on job satisfaction. The following null hypotheses were framed:

$H_0$2: There is no significant influence of women employee's (a) age (b) marital status (c) family type (d) family size (e) work experience (f) monthly income on Job satisfaction in unorganised sector

Table 2 shows the results of influence of women employee's demographic variables on Job satisfaction in unorganised sector in Kanchipuram.

Table 2: Influence of demographic variables on Job satisfaction

Variables	**Classification**	**N**	**Mean**	**S D**	**F values**
Age	18-29 years	199	3.36	0.779	**3.851** (p=.009)**
	30-39 years	192	3.27	0.794	
	40-49 years	97	3.36	0.718	
	Above 50 years	73	3.11	0.783	
Marital status	Married	330	3.33	0.769	**2.187 (p=.140)**
	Unmarried	231	3.26	0.791	
Family Type	Nuclear	261	3.32	0.764	**0.803 (p=.370)**
	Joint	300	3.28	0.792	
Family Size	Up to 3 members	190	3.29	0.752	**9.750** (p<.001)**
	4 & 5 members	274	3.38	0.801	
	6 & above	97	3.09	0.715	
Work experience	Up to 5 years	175	3.37	0.809	1.922 (p=.125)
	6-10 years	207	3.28	0.791	
	11-15 years	108	3.30	0.739	
	Above 15 years	71	3.18	0.715	
Monthly income	up to Rs. 6,000	82	3.37	0.874	**1.453 (p=.215)**
	Rs. 6,000 - 8,000	200	3.28	0.698	
	Rs. 8,000 - 10,000	89	3.38	0.887	
	Rs. 10,000 - 12,000	102	3.29	0.769	
	Above Rs.12,000	88	3.20	0.742	

**Significant at 1% level

Age

The obtained 'F' value is **3.851** and it is significant at 1% level. The value indicates that there is significant influence of age on job satisfaction of women employed in unorganised sector in Kanchipuram. Therefore, the formulated hypothesis "There is no significant influences of women employee's age on job satisfaction in unorganised sector" is rejected.

Further, the mean table 4.44 indicates that the respondents in the age group of 18-29 years and 40-49 years have scored higher mean value of **3.36** and the lowest mean value was scored by the respondents with age above 50 years (**3.11**). This shows that the women employees in the age group of 18-29 years are more satisfied with their job and the women employees in the age group of above 50 years are having lesser job satisfaction in unorganised sector.

Marital status

The obtained 'F' value is **2.187** and it is not significant at 5% level. The value indicates that there is no significant influence of marital status on job satisfaction of women employed in unorganised sector in Kanchipuram. Therefore, the formulated hypothesis "There is no significant influences of women employee's

marital status on job satisfaction in unorganised sector" is accepted.

Family type

The obtained 'F' value is **0.803** and it is not significant at 5% level. The value indicates that there is no significant influence of family type on job satisfaction of women employed in unorganised sector in Kanchipuram. Therefore, the formulated hypothesis "There is no significant influences of women employee's family type on job satisfaction in unorganised sector" is accepted.

Family size

The obtained 'F' value is **9.750** and it is significant at 1% level. The value indicates that there is significant influence of family size on job satisfaction of women employed in unorganised sector in Kanchipuram. Therefore, the formulated hypothesis "There is no significant influences of women employee's family size on job satisfaction in unorganised sector" is rejected.

Further, the mean table 4.44 indicates that the respondents living in the family of size 4 and 5 members have scored higher mean value of **3.38** and the lowest mean value was scored by the respondents living in family of size more than 6 members (**3.09**). This shows that the respondents in family of size 4 and 5 members are more satisfied with their job and the women employees living in family of more than 6 members are less satisfied with their job.

Work experience

The obtained 'F' value is **1.922** and it is not significant at 5% level. The value indicates that there is no significant influence of work experience on job satisfaction of women employed in unorganised sector in Kanchipuram. Therefore, the formulated hypothesis "There is no significant influences of women employee's work experience on job satisfaction in unorganised sector" is accepted.

Monthly income

The obtained 'F' value is **1.453** and it is not significant at 5% level. The value indicates that there is no significant influence of monthly income on job satisfaction of women employed in unorganised sector in Kanchipuram. Therefore, the formulated hypothesis "There is no significant influences of women employee's monthly income on job satisfaction in unorganised sector" is accepted.

3 Impact of Work life balance on Job satisfaction

Simple regression analysis was conducted by taking Job satisfaction of employees as dependent variable and Work life balance of women employed in Unorganised sector in Kanchipuram as independent variable, the following null hypothesis is framed [4].

$H_0 3$: Work life balance is not having significant impact on Job satisfaction

Table 3 shows the results of simple regression analysis for impact of Work life balance on Job satisfaction.

Table 3: Regression analysis for Job satisfaction

Independent Variable	R^2	Beta	F-statistics	t- value
Work life balance	**0.502**	0.624	**16.218****	9.217**

** Significant at 1% level

It is observed from the table 4, the regression model's **F** value is **16.218** and it is significant at 1% level, the null hypothesis "Work life balance is not having significant impact on Job satisfaction". The regression model's coefficient of determination (**R^2**) is **0.502** (**50.2**% of variability) which seems to be reasonably good. One unit increase in Work life balance significantly predicts and improves the Job satisfaction by **0.624** units. The regression equation for Job satisfaction of women employed in unorganised sectors in Kanchipuram is:

Job satisfaction = 1.321 + 0.624 (Work life balance)

Hence Work life balance significantly predicts and improves Job satisfaction of women employed in unorganised sectors in Kanchipuram[5].

FINDING

- Women employees are having moderate job satisfaction in unorganised sector in Kanchipuram. It is observed that the respondents are satisfied as construction labour, satisfied with the spirit of cooperation from the team, relationship with coworkers and mostly satisfied

with the pay. However they accepted that the job is not that much interesting, getting less motivation and less encouragement in balancing work and life.

- Significant influences of women employee's age and family size on job satisfaction in unorganised sector is observed, whereas such significance is not noted with marital status, family type, work experience and monthly income. Women employees in the age group of 18-29 years are more satisfied with their job and the women employees in the age group of above 50 years are having lesser job satisfaction in unorganised sector. Respondents in family of size 4 and 5 members are more satisfied with their job and the women employees living in family of more than 6 members are less satisfied with their job.

- Work life balance significantly predicts and improves Job satisfaction of women employed in unorganised sectors in Kanchipuram.

CONCLUSION

Finally it is concluded that the nature Construction sector falls under unorganized sector of an economy. Unorganized labourers refer to those workers who have not been able to organize themselves in pursuit of their common interest owing to certain constraints like casual and uncertain nature of employment, ignorance and illiteracy, small and scattered size of establishment. They are working under unsecured environment or work culture. The scenario only can be changed with the government intervention, by implementing the policies strictly. Strict action has to be taken against all those who harass the employees. It is very necessary to all workers to know about Government Schemes.

Ethical Clearance - I am bears of personal responsibility for any claim.

Source of Funding - Self

Conflict of Interest - Nil

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Knowledge on Effects of Substance Abuse among Adolescents: - A Descriptive Study

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ABSTRACT

Abuse of substances creates a great threat to the health, social and economic condition of individual, family, community and to the nation. In the past two decades' abuse of substances is an important public health concern among people, especially among adolescents. The major aims of the study were to determine the knowledge on the effects of substance abuse and to find the association between the level of knowledge scores on the effects of substance abuse among adolescents and selected demographic characteristics.Govt. PU College, Halayangadi, Dakshina Kannada District was the setting and 360 samples were selected by multistage random sampling technique. Data was collected by administering the structured knowledge questionnaire (r=0.82)with 30 items.Majority 180(50%) of the adolescents had average knowledge and least 27 (7.5%) had poor knowledge. The mean knowledge score was 24.87±6.435, with a mean percentage of (50.75%) revealing that the overall knowledge of the adolescents regarding effects of substance abuse was good. The study found out that there was no significant association between demographic characteristics and knowledge of the samplesat the significance level of 0.05.The study concluded that there is a need of motivational classes to prevent substance abuse in adolescence.

Keywords: *Substance abuse; knowledge; adolescents*

INTRODUCTION

Adolescents are the positive force of a Nation and are responsible for its future productivity. Adolescents are those belongs to the age between 10-19 years which constitute over 23% of the population in India. Adolescence is a phase of rapid physical growth, psychosocial development, and sexual transformation. Adolescents are with full of energy and have significant drive and new ideas[1]. Adolescents are in search of a sense of identityand it is the period of exploration and exploitation. In both developed and developing countries, adolescents face overwhelming problems. Among which early pregnancy, substance abuse, and violence are making them more vulnerable to life-threatening disease condition[2].

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Substance abuse is a social evil. It destroys not only vitals of the society, but also adversely affects the economic growth of the country. Use of substances knows no bonds or limitations. It spreads all over a country, from nation to nation; to the entire globe, infecting every civilized society irrespective of caste, creed, culture and the geographical location[3]. Globally, substance abuse is a serious public health and social issue. With changes into the lifestyle, globalization in substance marketing, the erosion of powers of censure that have existed in traditional societies, and an increased acceptance of such substances, it is clear that their use is growing in low and middleincome countries, particularly among the children, adolescents and the youth[4].

A national survey conducted by the Ministry of Social Justice stated that abuse of different drugs was prevalent in different states of India. Rajasthan has the highest proportion of opium users 76.7%, followed by Haryana 58.0%. So far as heroin is concerned, 43.9% of its users are found in Uttar Pradesh. Highest percentage 43.9% and 37.3% of alcohol consumption is in Orissa

and Himachal Pradesh[3]. A study made by the Link De-addiction and Rehabilitation Centre has found out that there was an alarming rise in use of drugs, tobacco and alcohol among 875 high school and pre-university students in Mangalore. The survey report claimed that out of 623 boys, 125 (20.1%) of boys and out of 252 girls, 11 (4.4%) of girls were afflicted by drugs, alcoholism and smoking tobacco[5].

NEED FOR THE STUDY

Substance abuse is a rapidly growing worldwide problem. The problem of substance abuse causes a considerable threat to the health of the individuals, social and economic status of families, societies and nations. Almost every country in the world is affected by substance abuse. Substance abuse has brought problems such as increase in violence and crime, increase in HIV/AIDS diseases, and collapse in the social structure. Substance use leads to health problems, social problems, physical dependence, and psychological addiction[6].

To find the pattern of drug use among adolescents a qualitative study was conducted at New Delhi, India. The study also aimed to find out the reasons for initiation of drug use and the perception about the effects of using drugs among adolescents. Five focus groups were formulated with 35 adolescent samples. Eight key informant interviews were conducted to rule out the prevalence of drug use among the samples. Group discussions were conducted for each group using a preplanned guideline with selected topics. Outcome of the study revealed that drug use was associated to other unlawfuldoings. Mass media especially cinema and peer group were the most significant inspirations for commencement of drug use among the samples. Various categories of drugs could be acquired effortlessly by themon their various stages of development. It was identified that there was a steady progression from non-use to tobacco use, from tobacco to alcohol use, alcohol to marijuana use and ultimately moving to other drugs by the children. Awareness on ill effects of consuming drugs on both medical and social properties did not seem to affect either the using up of drugs or the desire to put down this practice[7].

A study was conducted on the extent of substance abuse among the student community of Mangalore University colleges. The sample consisted of 15,000 students. The result showed that 1056 (7.04%) of the male and 60(0.4%) of the female population had accepted to be users of various stimulant substances ranging from Ganja to Heroin. Among these, 74 (6.6%) of the male and 5(0.4%) of the female population were found to be drug addicts. This percentage indicates that the number of addicts among the student population in Mangalore were approximately 1116 out of the total population of 15,000 under study[8].

OBJECTIVES

Objectives of the study were to:

1. determine the existing knowledge on the effects of substance abuse among adolescents using a structured questionnaire.

2. find the association between knowledge scores on the effects of substance abuse among adolescents and chosen demographic characteristics.

METHOD AND MATERIALS

Quantitative approach found useful for this study. Govt. PU College, Halayangadi, Dakshina Kannada District was selected as the setting for the study. The population comprised of adolescents belongs to the age group of 16-18 years, students of the selected pre-university college in Mangalore. The sample for the present study consisted of 360 adolescents, who met the sampling criteria. Multi-stage random sampling technique was appropriate to select 360 adolescents from a selected pre-university college of Mangalore as the sample for the present study. In the sample universe, there were 72 pre-university colleges. In the first stage, simple random sampling method, i.e., lottery method was adopted for selecting one pre-university college. Thus, Govt. PU College, Halayangadi was selected for the study. In the second stage, lottery method was used to select 360 samples from the selected PU college.

Development of the tool

An intense search for related literature was carried out and experts in the field of community nursing, community medicine, psychiatric nursing, school counsellors and psychologists were consulted for developing an appropriate tool. Content validity was established by the experts from the field of community health nursing, community medicine, psychiatric nursing, school counselling and psychology. Modifications were made as per the suggestions and the final tool came out

with 30 items.

Description of the tool

The questionnaire has 2 parts:

Part 1: It included 7 items of demographic variables such as age, gender, type of family, place of residence, living status, previous information regarding effects of substance abuse and the source of knowledge.

Part 2: It included 30 questions. It includes 6 sections like concept of substance abuse, concept about substances, physical effects of substance abuse, psychological effects of substance abuse, social effects of substance abuse and treatment modalities.

The respondents had to tick their answer. The correct answer carried '1' mark and wrong answer has '0.' Some questions had more than one correct answer. Maximum score was 49. The reliability knowledge questionnaire was established.

Data collection procedure

Prior permission was obtained from the BEO, Mangalore and Principal, Govt. PU College, Halayangadi, Dakshina Kannada. Keeping in mind the ethical aspect of the research, data was collected after obtaining informed consent of the sample. The respondents were assured of anonymity and confidentiality of the information provided by them. The researcher introduced himself to the participants. The objectives of the study were explained to the adolescents. The investigator himself collected the data. Data was collected using the knowledge questionnaire.

RESULTS

The results have been organized and presented in 3 parts:

Part I: Description of demographic characteristics of the adolescents.

Part II: Knowledge of adolescents regarding effects of substance abuse.

Part III: Association of knowledge of adolescents with selected demographic variables.

Part I: Description of demographic characteristics of the adolescents

Table 1: Frequency and percentage distribution of sample according to demographic characteristics

N = 360

Demographic variables		Frequency	Percentage (%)
1.	**Gender**		
a.	Boy	288	80.0
b.	Girl	72	20.0
2.	**Age in years**		
a.	16	144	40.00
b.	17	204	56.7
c.	18	12	3.3
3.	**Type of family**		
a.	Nuclear	201	55.8
b.	Joint	141	39.2
c.	Extended	18	5.0
4.	**Place of residence**		
a.	Urban	264	73.3
b.	Rural	96	26.7
5.	**Living with**		
a.	Parents	321	89.2
b.	Grand parents	3	0.8
c.	Relatives	30	8.4
d.	In hostel	6	1.6
6.	**Previous knowledge**		
a.	Yes	273	75.8
b.	No	87	24.2
7. Source of information			
a.	Parents	93	34.1
b.	Relatives	9	3.2
c.	Friends	75	27.5
d.	Media	96	35.2

Data presented in the Table 1 show that majority 288(80%) of the samples were boys and 72(20%) were girls. Highest percentage 204(56.7%) of students belongs to the age of 17 and least 12(3.3%) to the age of 18 years. Majority 201(55.8%) of the adolescents was from nuclear family and least 18(5%) were from extended family. Most 264 (73.3%) of the adolescents were living in urban area and 96(26.7%) were living

in rural area. Most 321(89.2%) of the adolescents were living with parents and least 3 (0.8%) was living with grandparents. Most 273(75.8%) of the samples had previous information on the effects of substance abuse and 87 (24.2%) not had any previous exposure knowledge to the effects of substance abuse.Among them majority 96(35.2%) of the adolescents received information from media and least 9(3.2%) received information from relatives regarding the effects of substance abuse.

Part II: Knowledge of adolescents regarding effects of substance abuse.

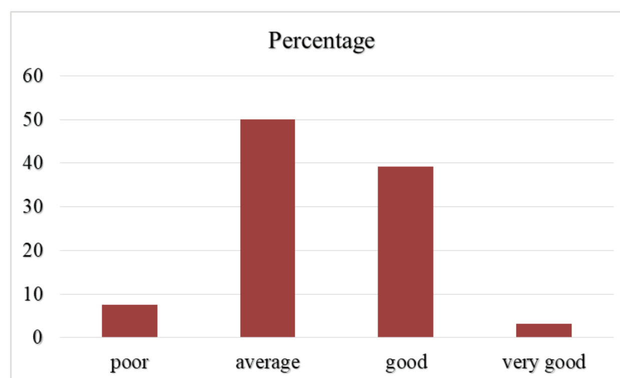

Figure 1:

Percentage distribution of existing knowledge of adolescents regarding effects of substance abuse N = 360

Data in the Figure 1 shows that majority 180(50%) of the adolescents had average knowledge, 141 (39.2%) had good knowledge, 27(7.5%) had poor knowledgeand least12 (3.3%) had very good knowledge oneffects of substance abuse.

Table 2: Area-wise mean, SD and mean percentage of knowledge scores of adolescents regarding effects of substance abuse N = 360

Knowledge area	Max. score	Mean	SD	% mean
Concept of substance abuse	7	4.13	1.675	51.67
Concept about substance	8	3.36	1.172	47.98
Physical effects	11	6.35	1.93	52.92
Psychological effects	9	5.17	1.798	51.67
Social effects	9	3.57	1.482	50.95
Treatment modalities	5	2.29	1.126	45.83
Overall knowledge	49	24.87	6.435	50.75

Data in the Table 2 revealed that adolescents had highest knowledge in the area 'Physical effects of substance abuse' with a mean percentage of 52.92% followed by 'Psychological effects' and 'Concept of substance abuse' with a mean percentage of 51.67%, 'Social effects of substance abuse' with a mean percentage of 50.95%, 'Concept about substances' with a mean percentage of 47.98% and least in the area 'Treatment modalities' with a mean percentage of 45.83%. The mean knowledge score was 24.87±6.435, with a mean percentage of 50.75% revealing that the overall knowledge of the adolescents regarding effects of substance abuse was good.

Part III Association of knowledge of adolescents with selected demographic characteristics

Table 3: Association of knowledge of adolescents on tobacco use and its hazards with selected demographic characteristics N=360

Demographic characteristics	Knowledge		df	χ^2	p value	Inference
	Poor	Good				
Gender Boy Girl	48 42	240 30	1	1.009	0.315	NS
Age 16 Above 16	42 24	102 192	1	2.679	0.101	NS
Type of family Nuclear Non Nuclear	36 39	165 120	1	2.227	0.135	NS
Place of residence Urban Rural	39 48	225 48	1	1.819	0.177	NS
Living with Parents Non parents	57 12	264 27	1	0.669	0.413	NS

(NS- Not significant; at $p<0.05$)

The data provided in Table 3 shows that there was no significant association among the knowledge scores with any of the demographic variables. So the null hypothesis i.e. there will be no significant association between the knowledge score of adolescents on the effects of substance abuse with the selected demographic variables, was accepted for all the variables.

DISCUSSION

The current study was designed to measure the knowledge among adolescents on the effects of substance abuse in a selected PU college of Mangalore. In view of the nature of the problem under study and to achieve the objectives, a quantitative approach with a descriptive design was found to be appropriate to describe the study. Multi stage random sampling technique was used to select the samples. The data was collected from 360 adolescents.

The findings of this study were supported by another study conducted on knowledge, attitude and perception of school going Bangladeshi adolescents on substance abuse. The study findings revealed that 70% of the sample knew the addictive properties of tobacco and 40% had the knowledge about the harmful effects of addictive substances on the body and society[9].

The area-wise analysis revealed that the adolescents scored highest in area of physical effects of substance abuse. The study findings were supported by a study conductedon tobacco consumption and awareness of their health hazards in National Capital Territory of Delhi.The samples for the study were from lower income group school children. It was found that nearly 80% of the study subjects were aware about the fact that tobacco consumption is injurious to health. The parents of 59% of the children shown interest to discuss the harmful effects of tobacco consumption with their children[10].

RECOMMENDATIONS

Based on the findings of the present study, the following recommendations are offered for further research:

- A large-scale study can be replicated among college students.

- A comparative study can be conducted to assess the knowledge of rural and urban adolescents on the effects of substance abuse.

- An awareness programme can be conducted to improve the knowledge of adolescents on the effects of substance abuse.

CONCLUSION

The overall findings of the study revealed that the adolescents have average knowledge regarding effects of substance abuse. There was no significant association among the knowledge scores with any of the demographic variables of the adolescents. So the study concluded that there is a need of awareness and motivational classes for adolescence in order to prevent use of substance among them and to build up a healthy and moral generation through which the society and the country can reach its heights.

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The Effect of Se'i (Smoked Beef) Toward the Improvement of the Bcl-2 Protein Expression on Colon Cells of Balb/c Strain Mice as a Carcinogenesis Indicator

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ABSTRACT

Se'i is smoked beef with added nitrite which can precipitate the Bcl-2 protein expression. The purpose of this study was to analyze the effect of se'i toward the improvement of the Bcl-2 protein expression on colon cells of Balb/c strain mice as an indicator of carcinogenesis. This research is true experimental with completely randomized design. Samples were male Balb/c mice, weighing 23.8 gram which was 36 mices, divided into 4 treatment groups P1: Mice were given se'i without nitrite with weight 8.840 mg for 28 days, P2: Mice were given se'i containing nitrite from the modern industry weighing 8.840 mg for 28 days, P3: Mice were given nitrite se'i from home industry weighing 8.840 mg for 28 days and K: Mice fed only standardize feed, and drinking water for 28 days. The examination was done by using immunohistochemical techniques to see the expression of a Bcl-2 protein. The result showed that there was a significant difference of Bcl-2 protein expression on colon cells of male Balb/c strain mice which are given se'i. The LSD test showed that there was a difference of Bcl-2 protein expression between P3, P1 and K. The new finding of this study is the provision of se'i causing the differences in Bcl-2 expression in all treatment groups.

Keywords: *se'i, nitrite, Bcl-2 expression.*

INTRODUCTION

Meat contains protein that has a function for cell growth, replacement of damaged cells and as a fuel in the human body. Therefore, the lack of protein can cause a disturbance in humans. The complete nutritional content and the diversity of its processed products make meat as a food that can hardly be separated from human life. However, the quality of meat circulating in the public is often not well guaranteed. The most important part of consumer reference in meat selection is physical properties.[1]

One effort to increase the shelf-life of the meat through the preservation of se'i manufacture, which aims to extend the meat shelf-life until just before consumption and to overcome the amount of beef that is quite a lot and not sold.[2] The amount of beef production in East Nusa Tenggara (NTT) province in 2014 is 73,886 with the amount of beef consumption in March of 2014 is 5,036,897 kg, of which 10% of the total consumption of beef is in the form of se'i.[3]

Processed beef products produced by the people of Kupang are se'i. Se'i (smoked beef local name) is one of processed beef by fumigation, which is a typical processed product from one of the regencies in East Nusa Tenggara region namely Rote Ndao.[4] Judging from the nutritional value, se'i has a high enough protein content between 30-32% with fat content ranging from 0.8-0.92%, high water content of 63%, causing se'i easily contaminated by microbes that result in very short shelf life of about 3 days.[5]

The results of preliminary study of se'i (smoked beef) consumption in Kupang city to 125 respondents who were taken accidentally in restaurants and se'i shops

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obtained, 95 (76%) of respondents said consuming se'i in a week average 1-3 kg, 18 (14.4%) of respondents consumed less than 1 kg of se'i per week and 12 (9.6%) people said consuming se'i in a week by more than 1 kg, the number of members in one family consuming se'i as many as 3-5 people, so the average consumption of each person in a day is 0.0857 kg. Nowaday, se'i is not only consumed by the people of Kupang city, but has been used as a souvenir and special food to entertain guests both government and household level.

Se'i processing requires nitrite (KNO_2), nitrite is one of the preservatives used in the process of preserving meat to obtain a bright red color and prevent microbial growth. Nitrite as a preservative is permitted in accordance with the Indonesian National Agency of Food and Drug Control regulation number 36 of 2013 on the maximum limit of nitrite use in meat processed products, poultry meat and game meat which is mashed, including se'i meat is 30 mg/kg, but in fact the se'i found the use of nitrite exceeds the threshold of the usage set by the regulation of Indonesian National Agency of Food and Drug Control.[6]

Based on preliminary research results in May 2016 toward nitrite content on se'i in the modern industry and home industry in Kupang city obtained nitrite content of se'i in modern industry average of 29.48 mg/kg, while for the home industry average of 56.63 mg/kg. Nitrite that enters the body along with food, will be absorbed in the lower digestive tract part, causing intestinal microbes transform nitrite into a more harmful compound, therefore the formation of nitrite in intestinum has important clinical significance for health problems. Nitrite can lead to vasodilation in blood vessels, due to nitrite changes to nitric oxide (NO) or NO-containing molecules that play a role in relaxing the smooth muscles, and nitrite in the body will bind proteins to form N-nitroso, these components can be formed when meats containing nitrites are cooked to a temperature high heat. The large amount of N-nitroso in the body can lead to ROS (Reactive Oxygen Species), the greater ROS (Reactive Oxygen Species) in the body results an increase in OH* that gives the effect of DNA damage (Deoxyribonucleic Acid), then cell death. Efforts to prevent cell death then cells express HSP (Heat Shock Proteins), in case of DNA disorders in protooncogeneration eg Bcl-2.

Knowledge of molecular biology responsible for the growth and development of colon cancer cells is essential in terms of determining biomarkers for early detection, prognostic indicators or clinical outcomes even in the development of therapies that have specific targets for certain genes or proteins that underlie carcinogenesis.[7] Progression of colon cancer is associated with failure in the mechanism of cell death facilitated by protein expression in regulating apoptosis. The family of protein B cell lymphoma-2 (Bcl-2) is already known as a specific protein in regulating apoptosis, its role in neoplasm proliferation is as antiapoptosis and proapoptosis.7 Protein Bcl-2 is the first characteristic genes involved in programmed cell death by inhibiting apoptosis (antiapoptosis) and enhancing the ability of cells to survive.[7,8]

Based on these descriptions, this study was conducted to determine the direct effect of se'i consumption on Bcl-2 protein expression in mice colon cells.

MATERIALS AND METHOD

This research is true experimental research by using completely randomized design. The location of this research is in the Biochemistry Laboratory and Physiology Laboratory, Faculty of Medicine, Airlangga University. The biochemistry laboratory as a place of the animal preparation process, treatment of weight measurement of se'i, feeding on mice and surgery of mice. The physiology laboratory as a place of preparatory preparation as well as measurement of growth expression of Bcl-2 protein in cells of mice colon. The study was conducted on January 2016-May 2017. The mice were used in 4 treatment groups. Randomization was performed to eliminate the bias (Notoatmodjo, 2012), divided into 2 treatment groups (t) given beef, and control group administered for 28 days (4 times cell growth), on day 28 will be done examination of Bcl-2 protein expression in mice colon cells using immunohistochemical methods observed by light microscope 10 areas with 400 times magnification. Bcl-2 expression data from each treatment that has been obtained using statistical technique is using computer program through F test (One way ANOVA with α = 0,05), to find out more difference between group hence used Post Hoc Test by using function LSD.

RESULTS AND DISCUSSION

Positive expression of the Bcl-2 protein is indicated

by the presence of brown granules in colon cells, Observation results using OLYMPUS DP40 Microscope. The color intensity of each preparation was observed in each of the ten plots of view with 400 × magnification. After obtained the result is calculated the number of cells that experienced a change of color to brown for each preparation and then determined the expression of the Bcl-2 protein.

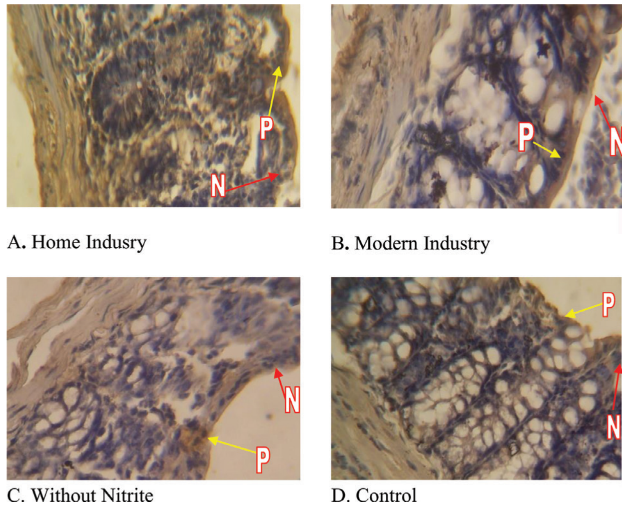

Figure 1. The Bcl-2 Protein Expression of Positive and Negative Given Se'i

The results of Bcl-2 expression testing with IHC painting on the mice's colon tissue with the treatment of se'i feeding on industrial home, modern industry, se'i without nitrite and control. Cells expressing Bcl-2 are marked with cyberspace cytoplasm (P arrow) whereas there is no brown coloration on colon cell painting, meaning no Bcl-2 expression (N arrow) is obtained.

Descriptive analysis showed the mean and deviation standard of the se'i feeding variable against Bcl-2 protein expression. Results shown in the table and box plots below, from samples of 36 male Balb/c strains of mice, obtained Bcl-2 protein expression with immunohistochemical immunization.

Table 1. Descriptive Analysis of Bcl-2 Protein Expression

Group	N	Mini-mum	Maxi-mum	Mean	SD
Se'i in home industry	9	256	393	300,77b	43,216
Se'i in modern industry	9	227	324	277,44ab	29,682
Se'i without nitrite	9	203	301	249,77a	36,334
Control	9	184	287	245,66a	28,995

Note: The same superscript ab showed no difference between groups (by LSD)

Table 1 shows the value of the Bcl-2 expression is the highest se'i group containing nitrite derived from the home industry average of 300.77 and the lowest was 245.66 in the control group. Test for normality using the Shapiro-Wilk against all treatment groups shows normal distribution of data obtained with the p-value (0.121, 0.996, 0.462, 0.448)>α (0.05).

Based on the figure 2 box plots the median amount of Bcl-2 expression colon cells in mice Balb/c higher than the control group with a group of home industries, modern industrial and without nitrite.

The Average of Bcl-2 Protein Expression

Home Industry Modern Industry Without Nitrite Control

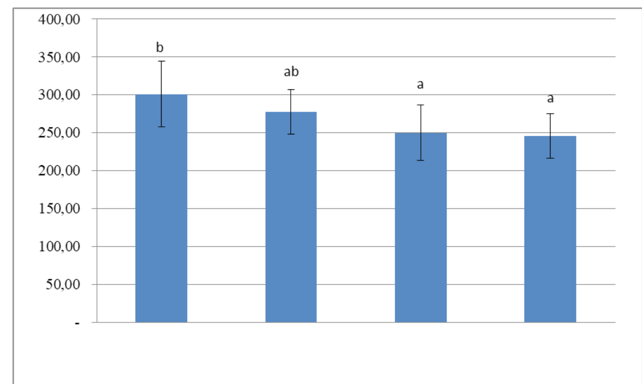

Figure 2. The Average of Bcl-2 Colon Cells Expression of Mice Balb/c

The essential nutrient components in se'i are protein, so the se'i is a source of protein and all essential amino acids that the body needed and digested easily. Besides se'i also contains B6 vitamin, B12 vitamin, and niacin. Zinc minerals, good iron and contain selenium and phosphorus.[9] The cholesterol content of various meats namely, beef contain cholesterol 84 mg/100 g. Beef in 3 ounces contains 179 calories, 7.9 g fat, 3.0 g saturated fat, 25 g protein and 73.1 mg cholesterol.[10] The beef in 100 g contained lower calories (498 kg), total fat (2.8g), unsaturated fats (0.448g), saturated fat (1.149g), cholesterol (50 mg). Se'i contains high

potassium with lower sodium level, also contains B complex vitamin and A and E vitamin which are very important as an antioxidant. The results of this study showed that treatment contains nitrite or not, toward the expression of the Bcl-2 protein was examined with immunohistochemistry. The results of this study found that on oral se'i dose of 8.840 mg/day for 28 days occurred Bcl-2 protein extraction in colon cells of male mice Balb/c strain. The expression of Bcl-2 showed significant differences between the se'i group containing nitrite from home industry on the non-nitrite group of se'i and the control group.

The Bcl-2 gene encodes a protein that acts as an anti apoptosis and a protooncogeneous group. Bcl-2 runss to suppress Bax function (proapoptosis) inhibits the ability of c-myc to induce apoptosis. The presence of Bcl-2 has a very important role in the apoptotic barrier of cancer cells/cell transformation.[11] One of the causes of Bcl-2 expression is that Bcl-2 forms pore in the membrane it embraces and interacts with other types of intracellular proteins that are directly or indirectly involved in the apoptotic process. This interaction indicates one of the Bcl-2's roles is to provide a place for other proteins so that the cellular activity of the related protein stops (eg Bax). Bcl-2 protein controls the checkpoint of the caspase activity path, so the possibility of Bcl-2 protein controlling the apoptotic pathway depends on or not on caspase (intrinsic path and extrinsic path).[12]

The results showed Bcl-2 expression in all treatment groups due to se'i given in mice for consumption induced or increased the Bcl-2 protein (protooncogene). This study is consistent with which states consuming red meat <70g / week will decrease 5-12% risk to cancer.[13] When the amount of Bcl-2 protein expression is low, pro-apoptotic protein (Bax) has a greater chance of binding to the BH3 protein and this bond is the initial initiation of the apoptotic process. The possibility of nitrosamine that is formed will encourage the increasing of Bcl-2 protein. The presence of Bcl-2 expression in all treatment groups is due to the physiology of the cell growth system in the individual governed by a balance between apoptosis and proliferation. There is a balance between Bcl-2 and Bax.[11]

CONCLUSION

There is a positive expression of Bcl-2 colon cells of mice fed on se'i that not contain nitrite and contains nitrite derived from modern industry and home industry and control in 8,840 mg/day for 28 days.

Ethical Clearance

Before conducting the data retrieval, the researchers conducted a decent test of ethics conducted at the Faculty of Public Health Airlangga University to determine that this study has met the feasibility. Information on ethical test that the study is eligible to continue. The feasibility of the research was conducted in an effort to protect the human rights and security of research subjects.

Source Funding

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Conflict of Interest

The authors declare that they have no conflict interests.

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Malaria and Nutritional Status among Female Adolescents in West Sulawesi, Indonesia

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ABSTRACT

Background: Adolescent girls are one of the vulnerable groups in which the nutritional demand increases. One of the most common nutritional problems in adolescent girl is anemia. This risk of anemia increases especially for those living in endemic area of malaria. The relationship between nutritional status and malaria is complex and involves many determinant factors.

Objective: This study aims to determine the relationship between anemia and nutritional status in adolescent girl in West Sulawesi Province.

Material and Method: This study was a cross-sectional and conducted in North Mamuju Regency, West Sulawesi Province. A total of 200 adolescent girls as the subjects from 4 schools were selected using two stage random sampling. The variables measured were malaria status, type of malaria, worm status, and nutritional status. Diagnosis of malaria is conducted by health professional based on the result of blood sample analysis (250-500 ml). The type of malaria was observed in the sub-sample (43 students). Nutritional status was calculated after measurement of body weight and height by using weight for height indices (WHZ score). Feces collected are to see the presence of worm infection. Bivariate and multivariate analyzes were performed using chi-square, t-test, and ANOVA analysis using SPSS 15.

Result: This study shows that most respondents have decent dwellings. It is characterized by 71.5% having own latrines, 60% having cemented wells, cemented floor (62.5%), and 73.5% tin roofs. This study also shows that the number of malaria was 21.5% and the dominant type of malaria was Tertiana (79.1%). Many of adolescent girls were malnutrition marked by BMI <17 kg/m^2, chronic energi deficiency, and anemia (9.5%, 54.5%, 71.9%, respectively). In addition, 28.5% of students were infected with the worms. Bivariate analysis showed that there was no significant association between malaria status and anemia (p = 0.368). However, it appears that those with malaria have lower mid-upper arm circumference (MUAC) than non-malaria. Similarly with the indicator of body mass index, adolescent girl with malaria had lower BMI than non-malaria (19.05 kg / m2 vs. 19.39 kg / m2). However, hemoglobin levels in the malaria group were higher than the non-malaria group (11.34 vs. 11.05).

Conclusion: The current study concluded that malaria in adolescent girl may have an impact on body composition but not on hemoglobin levels. Further studies need to be done primarily to see the long-term repercussions of repeated malaria in adolescent girls.

Keywords: *Anemia, nutritional status, Falciparum, body mass index, adolescent*

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INTRODUCTION

Malaria is still a substansial problem in some developing countries whose impact is very detrimental. Even the disease caused by Plasmodium falciparum infection is the main cause of morbidity and mortality in children and adolescents [1]. Malaria can have implications

for losing weight, so it is very influential on one's nutritional status. On the other hand, nutritional status is the most important determinant factor especially for growth and development in adolescence. So that the incidence of malaria in adolescents will of course have an impact on the growth and development of adolescents instead of nutritional problems exacerbate susceptibility to disease [2]. However, interactions between malaria and nutritional status are complex and influenced by demographic and individual variation [3].

In Indonesia, malaria is classified as a public health problem with many endemic areas of malaria. In Sulawesi, Mamuju and North Mamuju are endemic areas with high malaria cases. According to Riskesdas data [4], malaria prevalence in Mamuju Regency is 3.5% and North Mamuju is 5.8%, whereas the national prevalence is only 2.9%. However, of the total number diagnosed with malaria, only 36.1% received treatment [5]. The number of people receiving treatment is still very low and occurs throughout Indonesia. Though if not handled, it can cause serious consequences, including the burden of a very large cost. Governments in countries with malarial endemics issue 612 million USD for anemia national control program as well as 332 million USD for treatment [6].

The adolescent period is an important phase of life characterized by rapid, physical, psychological, and cognitive development. This development requires high nutritional needs [7]. In this period also, the risk of anemia arises because of the need for iron increases especially for young women. Malaria can also lead to anemia, so young women in malaria endemic areas are particularly susceptible to nutritional problems including anemia [2,8,]. As one of the endemic areas, a model of prevention in North Mamuju Regency will be developed. Therefore, more specific baseline data related to malaria and nutrition are needed so that the mitigation efforts are more well planned. This study aims to determine the relationship between anemia status with nutritional status in young women in West Sulawesi Province.

MATERIAL AND METHOD

This study is a cross-sectional that conducted in West Sulawesi, North Mamuju Regency. The population was young women aged 12-18 years. The number of samples obtained is 200 young women using two stage random sampling method. The first stage is chosing sub-district which has high level of endemicity that is Baras District. Then randomly selected 4 schools to get 200 young women.

The data is collected by using questionnaires, anthropometric measurements, and laboratory tests. Several variables studied are malaria status, nutritional status, and respondent characteristics. Malaria is diagnosed by taking blood samples of 250-500 ml by health personnel. Nutritional status is obtained after measurement of body weight and height calculated to body weight by height (BB / TB). The characteristics of respondents are represented by education and employment of parents, residence, health facilities. Feces collection is also worked to see the presence of worm infection. Bivariate and multivariate analyzes are performed using chi-square, t-test, and ANOVA analyzes using SPSS 15 (SPSS Inc.).

RESULTS

The characteristics of sanitation provide a picture that most respondents have decent dwellings. It is characterized by 71.5% having own latrines, 60% having wells, dominant house floors (62.5%), and 73.5% roofs made of zinc. Nevertheless, there are still 41.5% who have wooden house walls (table 1).

Table 1. Characteristics of Sanitation and Residence

Variable	N = 200	%
Latrine		
One's own	143	71.5
Public kiosk	20	10.0
River / pond / sea	15	7.5
Bushes / open spaces	16	8.0
Others	6	3.0

***Cont...* Table 1. Characteristics of Sanitation and Residence**

Source of drinking water		
River / embankment / reservoir	12	6.0
Cement wells	120	60.0
Well-cemented wells	22	11.0
The well is not cemented	10	5.0
Water springs	8	4.0
Hand pump	6	3.0
Water tap / municipal waterworks	6	3.0
Others	16	8.0
House floor		
Cement	125	62.5
Stone	21	10.5
Soil	3	1.5
Wood	43	21.5
Others	8	4.0
House wall		
Cement	77	38.5
Stone	33	16.5
Wood	83	41.5
Others	7	3.5
Roof		
Tile	21	10.5
Zinc	147	73.5
Palm fiber / sago palm	29	14.5
Others	3	1.5

This study also shows the history of the disease experienced by respondents in the last 1 month (can be seen in table 2).

Table 2. History of Disease and Handling

Variable	N	%
Symptoms of disease last 1 month (n = 189)		
Fever	30	15.9
Fever up and down periodically	11	5.8
Drought cold	14	7.4
Headache	53	28.0
Cough	28	14.8
Snotty	33	17.5
Difficulty	3	1.6
Shivering	1	0.5
Others	16	8.5
Handling (n = 112)		
Untreated	19	17.0
Hospital	7	6.3
Local gvt. clinic / Pustu / Posyandu	18	16.1
Orderly / BPS	14	12.5
Practice Doctor	9	8.0
Shaman	2	1.8
Treated alone	43	38.4

***Cont...* Table 2. History of Disease and Handling**

Menstrual history (n = 200)		
Age of first menstruation		
10-13 years	150	75.0
14-18 years	50	25.0
Long period		
3-7 days	194	97.0
8-12 days	6	3.0
Intensity of menstrual blood		
Many	47	23.5
Medium	132	66.0
a little	21	10.5

This study also shows the comparison of female teenage food intake as compared to Nutritional Adequacy Ratio (GD), it can be seen in table 4 for more detail. It appears that their macro and micro nutrient intake is very low. Intake of energy and protein is only 51.7% and 65.2% compared with AKG. Nonetheless, there are some fairly high nutrients such as Vitamin D, Vitamin B12, and Calcium (119.7%, 280.0%, 131.5%, respectively) in table 3.

Table 3. Comparison of Food Intake with Nutrition Adequacy Rate

Variable	AKG	Intake	%AKG
Energy	2100	1085.2	51.7
Protein	62	40.42	51.7
Vitamin A	500	254.1	50.8
Vitamin D	10	11.97	119.7
Vitamin E	8	3.6	45.0
Thiamin	1.0	0.41	41.0
Riboflavin	1.2	0.42	35.0
Niacin	10	6.3	63.0
Vitamin B12	1.0	2.8	280.0
Folic acid	130	82.5	63.5
Vitamin C	60	23.7	39.5
Calcium	700	139.9	20.0
Phosphor	450	591.9	131.5
Iron	19	3.45	18.2
Zink	15	3.56	23.7

According to malaria status, nutritional status, and worms status, malaria girls reach 21.5% and the dominant malaria type is tertiana 79.1%. Those with BMI <17 kg / m2 are 9.5%, KEK 54.5%, and anemia of 71.9% (table 4). There are 28.5% of worms with the most worm type is Trichuris (65.9%).

Table 4. Status of Malaria, Nutrition, and Hookworm

Variable	N = 200	%
Malaria		
Yes	43	21.5
No	157	78.5
Type of Malaria (n =43)		
Falciparum	9	20.9
Tertiana	34	79.1
Body mass index		
IMT <17 Kg / m2	19	9.5
IMT ≥17 Kg / m2	181	90.5
KEK Status		
KEK (<23.5 cm)	109	54.5
Normal (≥23.5 cm)	91	45.5
Status of Anemia		
Anemia (<12 g / dl)	69	71.9
Normal (≥12 gr / dl)	27	28.1
Status of Worms (n = 123)		
Yes	35	28.5
No	88	71.5
Types of worms (n = 44)		
Ascaris	8	18.2
Trichuris	29	65.9
Ancylostoma	3	6.8
Hymenolepisdiminuta	4	9.1

Bivariate analysis in Table 5 showed that there is no correlation between malaria status and anemia (p = 0.368). However, the status of malaria may have an impact on the nutritional status of young women.

Table 5. Malaria Relationship with Anemia in Young Women

Status of Malaria	Status of Anemia		P
	Yes (%)	No (%)	
Yes	65.4	34.6	0.368
No	74.3	25.7	

In figure 1, it is seen that those with malaria have an upper arm circumference average (LILA) lower than those not malaria.

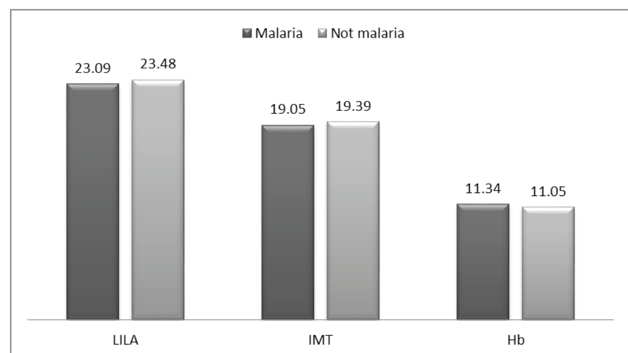

Figure 1. The average of LILA, IMT, and Hb level base on the malaria status

Similarly with the indicator of body mass index, malaria young girls have lower IMT than non-malarial female teenagers (19.05 kg / m2 vs. 19.39 kg / m2). However, Hb levels in the malaria group are higher than the non-malarial group (11.34 vs 11.05).

DISCUSSION

The problem of malaria cannot be ignored especially for those who are vulnerable groups such

as young women living in malaria endemic areas. The problem of clinical malaria in North Mamuju regency is very high [5]. In fact, the findings of this study, based on microscopic examination, have a very high prevalence of malaria, although still quite low compared with studies conducted in Sudan [3]. Many factors that encourage the occurrence of malaria, including climate and environmental factors. Unsafe environmental factors are associated with ongoing malaria transmission. The residential characteristic of the subjects in this study is quite good, characterized by the ownership of latrines, floors and cemented well walls. However, there are still households living in homes with wooden walls that can increase the risk of malaria. Studies in Cameroon indicate that individuals living in wooden house homes are significantly higher than those living in cement brick houses.[9]

On the other hand, young women need a lot of nutrients for growth and development. So young women living in this region have a high health risk. A study showed a link between P. falciparum malaria and nutritional status. Patients with malaria show very high symptoms of anorexia and vomiting. This is what triggers the patients unable to eat so as to obtain a low intake [10,11]. Another study specifically showed a significant association of P. falciparum malaria with wasting although not on stunting [12]. Malaria affects short-term nutritional status, except in those who have repeated malaria may be a cause of long-term nutritional problems such as stunting. However, recent studies in children aged 5-10 years show that malaria has a significant negative effect on growth velocity, even if it occurs in non-endemic areas and is due to p. vivax [11]. Malaria studies in early adolescence also showed a negative relationship to nutritional problems. Malaria accompanied by various symptoms such as diarrhea causes decreased intake and impaired nutrient absorption [13-15].

Another fundamental finding of this study is that the level of intake is quite low both macro and micronutrient. Vitamin A and zinc intake also show a very low lift compared to the needs of the body, whereas the role of vitamin A and zinc is very important. Vitamin A supports iron in the formation of hemoglobin while zinc plays a role in improving the immune system. A study showed a positive association of serum retinol levels with Hb concentrations [16]. The role of zinc is very large, not only helps iron and vitamin A in the formation of hemoglobin, but also play a role in the growth and improvement of the immune system [17]. When associated with malaria, low intake of micronutrients especially vitamin A, zinc, iron, and folic acid, increases morbidity and mortality of malaria [18, 19].

CONCLUSION

Based on the findings of this study, it can be concluded that malaria in adolescent girls has an impact on nutritional status. Low food intake and high levels of nutrient requirement potentially increase the risk of morbidity and mortality, especially for those who have malaria. Further studies need to be committed primarily to see the long-term repercussions of repeated malaria in young women in the future. In addition, it is necessary to screen regularly because the risk of exposure to malaria in endemic areas is very high.

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The Influence of Leadership Style of Midwife Coordinator Toward the Performance of Village Midwives on Antenatal Care Through the Job Involvement

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ABSTRACT

Currently, the maternal mortality rate (MMR) in Indonesia is still high at 305/100,000 births. The high rate of MMR can be caused by the quality of health services, especially by the village midwife as the spearhead of antenatal care which is still low. Factors that may affect the performance of the village midwives such as a leadership style and a job involvement. The research method is quantitative with cross-sectional study and sample size 95 village midwives spread to 13 public health center in Hulu Sungai Tengah District. The sampling technique used multistage random sampling. The data obtained were analyzed by the Partial Least Square (PLS) test at the 95% level of significance. The results showed that the leadership style of midwife coordinators had an effect on the performance of village midwife on the antenatal care through the job involvement (p=0.089). Leadership style is not significant to have a direct effect on the performance of village midwife on the antenatal care (p=-0.078). The conclusion of this research is to achieve a good performance can be pursued through high job involvement without being influenced by the leadership style, but to form a high involvement of work required a democratic leadership style of midwife coordinators.

Keywords: *leadership style, job involvement, performance, antenatal care*

INTRODUCTION

Currently, the maternal mortality rate (MMR) in Indonesia is still higher than the allowable target according to sustainable development goals (SDGs) of 70 per 100,000 births. Based on the Intercensal Population Survey (SUPAS) data of 2015, MMR in Indonesia is 305 per 100,000 births. The infant mortality rate in 2015 is 26 per 1,000 live births with a target of SDGs to be achieved by 2030 is 12 deaths every 1000 live birth.[1]

The number of maternal deaths in 13 districts and cities in South Kalimantan also increased in 2011 as many as 120 people become 123 people in 2012. Maternal deaths in 2012 are caused by, bleeding as many as 53 people (43.08%), 26 people of eclampsia (21.13%), 9 people of infection (7,31%) and others as many as 35 people (24,45 %).

Generally, maternal and child mortality can be prevented if a health care at the time of pregnancy (Ante Natal Care = ANC) can be done well. Data from The Health Office of Hulu Sungai Tengah Regency in 2015, shows that the antenatal care coverage is increasing but still below of target, that is 75,%. This number is still below the average number of South Kalimantan province which is 81.02% and the national average is 87.48%.[2]

The employee's performance is the result of work or activity functions in the form of behavior and outcome of behavior.[3] There are several variables that affect employee performance, such as leadership. The best job evaluation is done by the direct supervisor. Leadership is an attempt to use different types of non-coercive influence to motivate members of the organization to

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achieve the certain goals. The leadership style of a leader will greatly affect the working conditions, which will relate to how employees receive a leadership style, happy or not, like it or not. On the one hand, certain leadership styles can lead to improve the performance. On the other hand, can decrease the performance.[4]

Basically the performance is what employees do or not. There are many factors can affect the performance of the workforce, namely the ability, motivation, received support, the existence of the work they do, and their relationship with the organization. While other factors that become performance's determinant is job involvement.[5]

Based on the description above, the performance of village midwife in antenatal care also tends to be influenced by leadership style and job involvement of village midwives in doing their job activities.

MATERIALS AND METHOD

This research method using the quantitative method with cross-sectional study approach. The population in this study were all midwives, both village midwives and midwife coordinators in the working area of public health centers in Hulu Sungai Tengah district, amounting to 200 village midwives and 19 midwife coordinators. The sample size according to the formula of Lemeshow (1991), was 95 respondents (village midwife) obtained from 13 public health centers.[6] The sampling technique used in this study is multistage random sampling (Stratified-cluster nonproportional Random Sampling). The data obtained were analyzed using the PLS (Partial Least Square) test at a 95% significance level.

RESULTS AND DISCUSSION

The leadership style applied by the midwife coordinators to the village midwives in Hulu Sungai Tengah district is as follows:

Table 1. Leadership Style of Midwife Coordinators in Hulu Sungai Tengah District in 2017

No	Leadership Style	Total	Percentage
1	Otokratic	34	35,79
3	Demokratic	61	64,21
2	Laisses Faire	0	0
	Total	95	100

Table 1 shows that the most leadership style of midwife coordinators is the democratic leadership style of 64.21%. The involvement of village midwives in antenatal care in Hulu Sungai Tengah District can be described as follows:

Table 2. The Involvement of Village Midwives on antenatal care in Hulu Sungai Tengah District in 2017

No	Indicators	Distribution		
		Type	Amount	Percen-tage
1	Liveliness to Participate	Low	29	30,53
		Height	66	69,47
2	Job Preferences	Low	20	21,05
		Height	75	78,95
3	Employment award	Low	23	24,21
		Height	72	75,79
	Total		**95**	**100**

Table 2 shows that the involvement of the village midwife in the most antenatal care is a high involvement in participatory activeness indicators (69.47%), job performance indicators (78.95%), and employment award indicators as part of self-esteem (75.79%). The performance of village midwives in antenatal care in Hulu Sungai Tengah district can be described as follows:

Table 3. The Performance of Village Midwives on Antenatal Care in Hulu Sungai Tengah District in 2017

No	Indicators	Distribution		
		Type	Amount	Percen-tage
1	Input	Less	0	0
		Enough	61	64,21
		Good	34	35,79
2	Process	Less	0	0
		Enough	49	51,58
		Good	46	48,42
3	Output	Less	0	0
		Enough	50	52,63
		Good	45	47,37
	Total		95	100

Table 3 shows that the performance of village midwives in the most antenatal care is enough in input indicators (64.21%), process indicators (51.58%), and output indicators (52.63%). The influence of research

variables was done through the PLS test on the degree of significance of 95%, showing the results as follows:

Table 4. The Interpretation of Direction and Significant Value That Influence Variables

No	The influence of variables	Value	T score	Description
1	Leadership style → Performance	0.078	0.676	Positive influence is not significant
2	Leadership style → job involvement	0.277	2.957	Positive influence is significant
3	Job involvement → performance	0.321	3.244	Positive influence is significant
4	Leadership style →Job involvement →Performance	IE = (pX_1Z x pZY) (0,277x0,321) = 0,089	T X_1Z = 2,957 T ZY = 3,244	Significant influence

Table 4 shows that leadership style has a positive effect on the performance through job involvement, but leadership style has no direct effect on the performance. The influence of these variables can be described as follows:

a. Leadership Style Has No Effect on The Performance

The results obtained information that the leadership style has not directly affected the performance. There is also no relationship between leadership style and midwife performance in Kebumen District. In order to improve the performance of village midwives, supervision by supervisors (midwife coordinator) is a supporting factor. Supervision is a plenary function in supervision and subordinates supervision. Supervision is the process that requires the work unit to contribute positively to the organization's objectives. Supervision of superiors is a factor supporting the improvement of village midwife performance.[7]

The performance depends on the monitoring and evaluation of the supervisor, so that if the monitoring and evaluation are not done regularly then the motivation of employees to work better will decrease. Because the task is a routine task in antenatal service which has been widely understood by the midwife.

b. Leadership Style Effect on The Job Involvement

The results of this study indicate that leadership style has an effect on job involvement. The research conducted in Lahat District of South Sumatera showing that there is a positive and very significant relationship between democratic leadership style and employee's job involvement with a correlation coefficient (r) = 0,562 and error probability p) = 0,000. This means that if the employee perceptions of the democratic leadership style are positive so the employee's involvement is high, and vice versa if the employee's perceptions of the democratic leadership style are negative so the employee's involvement is low.[8]

Leadership is a relationship created by the influence have by a person toward the other person willingly cooperates to achieve the goal. With a democratic leadership style decisions are taken always based on the agreement of each boss and subordinates so that subordinates will involve themselves fully in the work that has been agreed.

c. Job Involvement Effect on The Performance

The results of PLS test analysis in this study indicate that job involvement has an effect on the performance of village midwife on antenatal care. It is caused by the full job involvement, the employee will create a good performance in completing the job or task and employees will be more satisfied and happy if you can spend most of the time, energy, and thoughts for the job.

Productivity (performance) of employees can be measured through a productive behavior inherent in the individual if the individual is getting meaning in his work. When an individual's work in the organization has to mean for himself and his life as a whole, then the productive behavior will be defended. To get a meaning in his work, then the individual must have the opportunity to develop the potential and advantages, and in accordance with their values. The opportunity to develop the potential can be gained through job

involvement.[9]

The increasing of job involvement can improve organizational effectiveness and productivity by involving more workers in a real way in working so that workers experience more meaningful and satisfactory.[10] A high-involving employees favor to the kind of job done and genuinely concerned with the type of job. If the job is considered meaningful and highly valued both material and psychological for the worker then the worker will appreciate and will do their jobs as well as possible so that job involvement can be achieved, and the employee feels that their job is important to his self-esteem.[11]

d. Leadership Style Affects The Performance through Job Involvement

The result of PLS test analysis in this research indicates that the leadership style of midwife coordinator has an effect on the performance of village midwife on antenatal care through job involvement. This is because the democratic leadership style allows communication between superior and subordinate, then it can motivate the involvement of village midwife in all antenatal care program becomes high. A high job involvement causes most individual attention to focus on the job so that the individual will be able to produce the maximum possible performance.[12]

CONCLUSION

Based on the findings of the study it can be concluded that to achieve good performance can be pursued through a high job involvement without being influenced by the leadership style applied by his supervisors, but to establish a high level of job involvement requires a democratic leadership style.

Ethical Clearance: Before conducting the data retrieval, the researchers conducted a decent test of ethics conducted at the Faculty of Public Health Airlangga University to determine that this study has met the feasibility. Information on ethical test that the study is eligible to continue. The feasibility of the research was conducted in an effort to protect the human rights and security of research subjects.

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The Analysis of Strategic Plan on Sambang Lihum Psychiatric Hospital Kalimantan, Indonesia 2016-2021 toward Drug Rehabilitation with Good Clinical Governance Framework

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ABSTRACT

The strategic plan will be able to overcome the problems in hospitals are required for clinical governance leads to be good. The strategic plan on Sambang Lihum Psychiatric Hospital issued in 2016, need to analyze with a good clinical governance framework. The design of this research is qualitative with phenomenology approach. The research informants are hospital director, program staff and staff in charge of drug rehabilitation. Results of the analysis showed that the strategic plan 2016-2021 of Sambang Lihum Psychiatric Hospital on drug rehabilitation, in general, has led to good clinical governance which can be seen from the efforts made, focus on the consumer. Customer value in the form of a satisfaction survey, focus group discussion and availability of information has been managed well. The performance management and clinical evaluation of standard operating procedures, clinical pathways, and clinical audit have been carried out properly. Risk management monitoring and reporting of unexpected events are undertaken and clinical audits in case of unexpected events. The unresolved thing is the management and professional upgrading of unresolved credentials of all unfilled professions and human resources (addictive counselors).

Keywords: *drug rehabilitation, sambang lihum psychiatric hospital, strategic plan, good clinical governance.*

INTRODUCTION

The concept of clinical governance developed by Scally and Donaldson (1998) adopted in Indonesia to increase the quality of clinical care and patient safety and is expected to be a framework for improving the quality of clinical services at the hospital. Clinical gov ernance is a framework that aims to ensure that health services can be held either by a high standard of service and did in the work environment with a high level of professionalism. [1,2]

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The final goal of good clinical governance is to improve health status through the maximum of clinical effort at the most efficient cost. Four pillars of good clinical governance that customers value, performance management and clinical evaluation, risk management, and managing and enhancing a professional. [3, 4]

In 2016, Sambang Lihum Psychiatric Hospital issued a strategic plan for the period 2016-2021. Sambang Lihum Psychiatric Hospital has a very strategic role, and the only one dealing with mental disorders and drug rehabilitation and becomes a referral center in South Kalimantan. [5]

The previous research found that the drug rehabilitation at Sambang Lihum Psychiatric Hospital

has not done the maximum. It deals with the rehabilitation program are incomplete, inadequate infrastructure, poorly trained staff, lack of empathy in their work and a lack of cooperation between staff, lack of allocation of funds for the rehabilitation program, as well as the lack of cooperating with other agencies concerned.[6]

According with the strategic plan 2016-2021 of Sambang Lihum Psychiatric Hospital stated that they committed to enhance or develop the facilities and infrastructure of mental health services, improve the hospital information system management, improving the quality and quantity of human resources, improving the quality of mental health services through hospital accreditation and quality assurance management, enhancing or developing mental health service coverage, improving or developing public health services and increasing the efficiency and effectiveness of health care financing through the guarantee of health costs (total coverage).[5]

Therefore, it is important to analyze the strategic plan 2016-2021 of Sambang Lihum Psychiatric Hospital with good clinical governance framework.

MATERIALS AND METHOD

This is a qualitative study with a phenomenological approach. The research was conducted at Sambang Lihum Psychiatric Hospital South Kalimantan. The object of research is a strategic plan of Sambang Lihum Psychiatric document year 2016-2021 with the informants who are hospital director, program, and planning staff, and 2 staffs working in drug rehabilitation room of Sambang Lihum Psychiatric Hospital. The research instrument is the researcher himself. Data were taken with in-depth interviews, field observations and document studies. The tools used are recording instruments, stationery, and notebooks.

RESULTS AND DISCUSSION

This study was to analyze the strategic plan of Sambang Lihum Psychiatric Hospital with four pillars of good clinical governance, namely customer value, performance management and clinical evaluation, risk management, and management and professional enhancement. Sambang Lihum Psychiatric Hospital in 2016 issued a strategic plan for the period 2016-2017. The vision contained in the formulation of strategic plan 2016-2021 is “Creating the hospital which always acted, and adapted and transformed quickly, including a creation and innovation and always in front of other hospitals, both a psychiatric hospital and general hospital throughout Indonesia”. The vision with 35 words has own meaning each word so that if not done a good socialization can cause different perceptions by every individual in the hospital.

The missions listed in the strategic plan 2016-2021 are:

1. Creating visionary, transformative and kindly leadership for the smooth process of regeneration.

2. Creating an employee who cares and empathizes with clients and has a responsible membership, excellent service, with total adherence to service provisions including the prevention of corruption, collusion, and nepotism.

3. Creating togetherness based on discipline, communication, justice and mutual understanding for the commonweal.

4. Maintaining the environment, in order to remain sustainable and seek medical and non-medical measures in a plenary, to follow to preserve the environment.

Based on the exposure of the mission can be concluded that the Sambang Lihum Psychiatric Hospital has led to the principles of good clinical governance that is focused on the consumer.

Customer Value

Based on observations of the Sambang Lihum Psychiatric Hospital strategic plan documents and interviews with executive staff and the Director of Sambang Lihum Psychiatric Hospital with regard to customer value can be concluded that the policy direction of Sambang Lihum Psychiatric Hospital always focussed to the patient, as a benchmark conducted customer surveys focus groups discussion did as an effort to pay attention of consumer interests, dissemination of information is also maximized through health education, leaflets, and websites that are well managed. Informed c onsent is an approach to the truth and patient involvement in decisions about treatment also performed well as a form of commitment the Sambang Lihum Psychiatric Hospital on the service involve patients and families that a good clinical governance area of communication competence and customer value is the participation of

patients and customers.[5, 7, 8]

Another thing that is contained is increasing the efficiency and effectiveness of health care financing through the guarantee of health costs are in line with the Strategic Plan of the Ministry of Health in 2015-2019 which at one point is to develop and increase the effectiveness of health financing.[5, 9]

Performance Management and Clinical Evaluation

Policies related performance management contained in the strategic plan 2016-2021 of Sambang Lihum Psychiatric Hospital is to enhance the quality of mental health services through quality assurance management. The quality standard becomes one of Sambang Lihum Psychiatric Hospital tactics that is an effort to perform service that fulfills standard and believed to have the best quality, from the side of healing, security, financing and client's satisfaction. Step in ensuring performance management is contained in the standard operating procedures, clinical pathways, and clinical audit.[5]

Clinical pathways incorporate all health worker standards systematically. The action is given a uniform standard of care, but still, consider individual aspects of patient and customer satisfaction indicators, there is a tendency increased after the implementation of a clinical pathway. [10, 11]

The clinical audit at Sambang Lihum Psychiatric Hospital was conducted by the committee concerned with the assistance of Internal Audit Unit (IAU) established by the Director of Sambang Lihum Psychiatric Hospital. The clinical audits bring a positive and significant impact on the effectiveness of operational audit of health services.[12]

In this section, Sambang Lihum Psychiatric Hospital already led to the principles of good clinical governance.

Risk management

Risk management is contained in the first mission is to improve preventive mental health services. The indicators are the achievement of a reduction in treatment days, no suicides during treatment and no cases of patients running during treatment. Efforts are made therein to prevent unexpected events in the form of recording and reporting. [5, 13]

Recording and reporting of indicators/quality objectives is the act of recording, monitoring and reporting quality indicators/targets undertaken by all related units. Reporting is how to make the evaluation of the implementation of these activities, in this case, related indicators of quality of hospital and when the report should be made. Each reporting, if necessary clinical audit involving all committees related with the assistance of the Internal Audit Unit (IAU) Sambang Lihum Psychiatric Hospital, this is done in addition to maintaining the quality of the hospital, also to avoid medical personnel charged with a law case. [13]

In this section, we can also be said that Sambang Lihum Psychiatric Hospital focuses on patients who are good clinical governance principles.

Professional management and upgrading

The strategies developed to achieve the goals and objectives of professional management and improvement that can be seen in Sambang Lihum Psychiatric Hospital Strategic Plan 2016-2021 is to improve the planning, procurement, and utilization of competent Human Resources (Health Workforce). Some of the strategies and policies related to professional improvement is to increase the quality and quantity of human resources, budgets inventory increased for education and training and operational use of medical equipment and the provision of reward and punishment to enforce disciplin.[5]

Sambang Lihum Psychiatric Hospital have done the credential process. A right but it has completed the nursing profession credentials only, while other professions are still in the process of implementation. Although it has been implemented, it must still need ratification by the document, considering that nowadays many hospitals are sued by law. Credentials are performed to obtain clinical authority for medical personnel. Clinical privilege is the exclusive right of a medical staff to perform a certain group of medical services in a hospital environment for a certain period conducted by clinical appointment. One element of malpractice is not followed professional standards and standard operating procedure. [14, 15, 16, 17]

Another effort done by Sambang Lihum Psychiatric Hospital is by recruitment. The need for health

workforce undertook a driving factor for recruitment of health workforce. The recruitment process at Sambang Lihum Psychiatric Hospital through the reception of civil servants and non civil servants. Civil servant income depends on the allocation of human resources from the Provincial Government of South Kalimantan through the Local Employment Agency. As for non-civil servant employees must still get an approval from Local Employment Agency of South Kalimantan Province. The problem that occurs is with regard to human resources, South Kalimantan Local Employment Agency has no legal rules for the formation of counselor addiction, so the result is the unavailability of human resources counselor addiction. However, Sambang Lihum Psychiatric Hospital has taken coordination steps.[18, 19]

Other efforts in professional management and upgrading conducted at Sambang Lihum Psychiatric Hospital are through formal and informal education and ongoing training. Continuous education and training is something that must be implemented in ensuring the competence of employees, planning must be done carefully, especially in terms of implementation budget. The budget amount will be efficient if the human resource character matches the character of the hospital. However, the budget becomes big if necessary to transform human character that is different from the culture and value of the hospital organizations.[20] This means that education and training should be adjusted to the hospital necessary and the selection of the right employees. Informal education includes external training and internal training. Training and education are given as a reward to employees who have worked well and have the potential to be developed.

All the areas of competence of good clinical governance, management, and professional improvement have done by Sambang Lihum Psychiatric Hospital, although not perfect, especially in the credentials and human resource procurement.

CONCLUSION

1. Analysis of the strategic plan 2016-2021 Sambang Lihum Psychiatric Hospital for the rehabilitation of drug with good governance framework was found that in general has led to good clinical governance which can be seen from the efforts made to focus on the consumer.

2. Regarding customer value, satisfaction surveys, focus group discussions and the availability of information has been managed well. Based on the clinical evaluation of performance management and standard operating procedures, clinical pathways and clinical audit have been carried out properly. On risk management, monitoring and reporting of unexpected events are carried out and a clinical audit in case of unexpected events.

3. The unresolved thing regarding professional management and improvement, the unresolved is the unfinished credentials of all unfulfilled professions and human resources (addiction counselors).

Ethical Clearance: This study was approved and received permission from the Public Health Research Ethics Committee of the Faculty of Medicine, Lambung Mangkurat University, Indonesia. In this study, we follow the guidelines of the Ethics Committee to obtain ethical permits and informed consent. Includes research title, objectives, informant's right, confidentiality, and signature.

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Conflict of Interest: The authors declare that they have no conflict of interest.

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The Role of Domicile on the Achievement of Village Midwife Performances in Antenatal Care through a Job Involvement

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ABSTRACT

The pervalence of maternal mortality rate (MMR) in Indonesia is still high at 305/100,000 births and can be caused by the quality of health services, for example the village midwife as the spearhead of antenatal care which is still low. There are many factors that can affect the performance of the village midwives such as a domicile and a job involvement. This research use a quantitative with cross-sectional design and sample size 95 village midwives spread to 13 public health center in Hulu Sungai Tengah District. The sampling technique used multistage random sampling. The data analyze by the Partial Least Square (PLS) testwith the level of significance 95%. The results showed that the domicile effect on the performance of village midwife on the antenatal care through the job involvement (p=0.092). Domicile is not significant to have a direct effect on the performance of village midwife on the antenatal care (p=-0.073). The conclusion of this research is a high job involvement without being influenced by the domicile can achieve a good performance, but to form a high job involvement required domicile of the village midwife who resides in the assisted village.

Keywords: *domicile, job involvement, performance, antenatal aare*

INTRODUCTION

The prevalence of maternal mortality rate (MMR) in Indonesia is still higher than the allowable target according to sustainable development goals (SDGs) of 70 per 100,000 births. The data from Intercensal Population Survey (SUPAS) 2015 shows that MMR in Indonesia is 305 per 100,000 births. A high maternal mortality can be caused by the low quality of health services especially on the Antenatal Care (ANC). Therefore, the government through the village midwife program strives to increase the antenatal service can be reached by the community extensively to the remote area level.[1]

One of the districts in South Kalimantan in 2015 with low coverage of antenatal care is Hulu Sungai Tengah District, which is 75%. This rate is still below the average of South Kalimantan province rate of 81.02% and the national average of 87.48%. This rate shows that the performance of village midwives who are the spearhead of antenatal care is also not good.

Factors that influencing the performance are a commitment, job motivation, job satisfaction, participation and empowerment, and job involvement.[2,3,4,5] A high level of employee engagement between employees can be effective for improving performance and encouraging more positive attitudes and behaviors.[6] Residential/domicile is a demographic factor that also affects performance.

Based on the description above, the performance of village midwife in antenatal care also tends to be influenced by the village midwife's domicile and the involvement of the village midwife in doing the job activity.

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MATERIALS AND METHOD

This research method is quantitative that use cross-sectional study approach. The population in this study were all midwives, both village midwives and midwife coordinators in the working area of public health centers in Hulu Sungai Tengah district, amounting to 200 village midwives and 19 midwife coordinators. The sample size according to the formula of Lemeshow (1991), was 95 respondents (village midwife) obtained from 13 public health centers.[7] The sampling technique used multistage random sampling (Stratified-cluster nonproportional Random Sampling). The data obtained were analyzed by the Partial Least Square (PLS) test at the 95% level of significance.

RESULTS AND DISCUSSION

The respondent's domicile while performing duties as a village midwife e in Hulu Sungai Tengah District is as follows:

Table 1 : Distribution of Village Midwife Domicile in Hulu Sungai Tengah District 2017

No	Domicile	Amount	Percentage
1	External villages	16	16,84
2	Internal villages	79	83,16
	Total	**95**	**100%**

Table 1 shows that the village midwife domicile is mostly resident in the target villages of 83.16%. The job involvement of village midwives on antenatal care in Hulu Sungai Tengah District can be described as follows:

Table 2: The Village Midwife Involvement on Antenatal Care in Hulu Sungai Tengah District 2017

No	Indicators	Distribution		
		Type	Amount	Percent
1	Liveliness to Participate	Low	29	30,53
		Height	66	69,47
2	Job Preferences	Low	20	21,05
		Height	75	78,95
3	Employment award	Low	23	24,21
		Height	72	75,79
	Total		**95**	**100**

Table 2 shows that the job involvement of the village midwife is mostly high involvement in the employment awards indicator as part of the self-esteem (75.79%), job preference indicator (78.95%) and liveliness participating indicator (69.47%). The performance of village midwives on antenatal care in Hulu Sungai Tengah district can be described as follows:

Table 3. The Performance of Village Midwives on Antenatal Care in Hulu Sungai Tengah District in 2017

No	Indicators	Distribution		
		Type	Amount	Percentage
1	Input	Less	0	0
		Enough	61	64,21
		Good	34	35,79
2	Process	Less	0	0
		Enough	49	51,58
		Good	46	48,42
3	Output	Less	0	0
		Enough	50	52,63
		Good	45	47,37
	Total		**95**	**100**

Table 3 shows that the performance of village midwives in the most antenatal care is enough in input indicators (64.21%), process indicators (51.58%), and output indicators (52.63%). The influence of domicile variables, work involvement, and performance, is done by PLS test with the following results:

Table 4. The Interpretation of Direction qnd Significant Value That Influence Variables

No	Influence of Variables	Value	T Skore	Information
1	Domicile→ Performance	0.073	0.684	Positive influence is not significant
2	Domicile → job involvement	0.288	2.075	Positive influence is significant
3	Job involvement → performance	0.321	3.244	Positive influence is significant
4	Domicile →Job involvement → Performance	IE = (pX_1Z x pZY) (0.288x0.321) = 0.092	T X_1Z = 2.075 T ZY= 3.244	Significant influence

Note : IE = *Indirect Effect*

Table 4 shows that the village midwife's domicile has a positive effect on the performance through the job involvement, but the village midwife's domicile has no direct effect on performance. The influence of these variables can be described as follows:

a. Domicile Effect on The Performance

The result of PLS test analysis in this research indicates that domicile has no significant positive effect on the performance of village midwives. This means that the village midwife domicile in the built village by chance has an influence on the achievement of good performance so that it can be ignored. This condition tends to be caused by the long working period of the village midwife and the level of education is mostly higher education so that it can further increase the professionalism of work regardless of the domicile where the midwife is located.

This situation is not in accordance with Herzberg which states domicile is a part of the hygiene factors and a thing that will improve the performance. This meaningless effect can be caused by other factors affecting performance, including the lack of community response to village midwives.[8]

The results of this study obtained the information that village midwives both living internally and externally from the target villages have an equal performance sufficient on the antenatal care. This study is in accordance with the previous research which states there is no significant difference between the village midwife's domicile and its performance.[8]

b. Domicile Effect on The Job Involvement

The domicile of the village midwives is the working area of the midwife as well as they perform daily activities, both activities related to the health of both mother and child services and personal activities. Village midwives living in the assigned village areas will more easily play an active role in antenatal care. This is caused by the easy accessibility of the village midwife.

The accessibility is a measure of convenience or ease of location of land use interacting with each other and the easy or difficult location is achieved through the transport network system.[9] The accessibility is a concept that incorporates a geographical land use arrangement system with a transport network system that connects it. Accessibility is a tool for measuring the potential for a travel besides to counting the number of trips themselves.[10] The accessibility can be expressed by distance, while others claim that accessibility is expressed by travel time. Some claim that accessibility is expressed by the magnitude of the cost of transportation and some express accessibility is expressed in terms of combined costs of transportation and travel time.[11]

Other causes, domicile in local villages will lead to strong linkages in the form of attachments such as meetings, physical activities or voluntary work. The longer a person lives and settles in an area in general will give a positive influence for the development of

his psychological life so it can stimulate a sense of deep ownership that eventually grows awareness to maintain, manage and develop a result development in the form of improvements to existing facilities and infrastructure.[12]

c. Job Involvement Effect on The Performance

The research results that job involvement has an effect on the performance of village midwife on antenatal care. It is caused by the full job involvement, the employee will create a good performance in completing the job or task and employees. It will be more satisfied and happy if you can spend most of the time, energy, and thoughts for the job.

The performance of employees can be measured through a productive behavior inherent in the individual if the individual is getting meaning in his work. When a job individual has to mean for himself and his life as a whole in the organization, then the productive behavior will be defended. The individual must have the opportunity to develop the potential and advantages to get a meaning in his work, and in accordance with their values. The opportunity to develop the potential can be gained through job involvement.[13]

The increasing of job involvement can improve organizational effectiveness and productivity by involving more workers in a real way in working so that workers experience more meaningful and satisfactory.[14] A high-involving employees favor to the kind of job done and genuinely concerned with the type of job. If the job is considered meaningful and highly valued both material and psychological for the worker then the worker will appreciate and will do their jobs as well as possible so that job involvement can be achieved, and the employee feels that their job is important to his self-esteem.[15]

CONCLUSION

Based on the research findings it can be concluded that to achieve good performance can be pursued through a high job involvement without being influenced by the village midwife domicile, but the village midwife domicile in the assisted village has a role in increasing the high job involvement.

Ethical Clearance: Before conducting the data retrieval, the researchers conducted a decent test of ethics conducted at the Faculty of Public Health Airlangga University to determine that this study has met the feasibility. Information on ethical test that the study is eligible to continue. The feasibility of the research was conducted in an effort to protect the human rights and security of research subjects.

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A Cause-effective Relationship between Tourism and Food Culture

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ABSTRACT

In recent years, Cuisine has established itself as one of the key elements for the enhancement, sustainable and consolidation of tourist destinations. The aim of this paper is to contribute to the advancement of knowledge on culinary tourism in India, specifically in the analysis of the relationship between Cuisine, culture and tourism as the research focuses on the city of Sivagangai district, Tamilnadu State. The methodology of this research involved conducting surveys with foreign travelers who were lunching or dining at various restaurants in the historic area, and these facilities were characterized by having in their culinary menus major typical culinary products of the city using the concept of Chettinad Mess, i.e., the presentation of Cuisine through small portions of food. The results of the study indicate that the healthy component of the Cuisine represents the main dimension.

Keywords: *Cuisine; Chettinad Mess; culture; tourism; sustainable*

INTRODUCTION

Food tourism studies have emerged in recent decades, focusing on food destination, food tourists and hygiene issues, using both qualitative and quantitative analyses[1]. Culinary tourists experience a complete sensory experience, especially in terms of flavor, suggesting, according to Cohen and Avieli[2], that through food, tourists receive a greater engagement with the environment where the visit takes place, far from the role of simple observer traditionally associated with tourist visits. In addition, Cuisine is part of the cultural, social, environmental, sustainable and economic history of state and their people. This is because it reflects a certain lifestyle of the different geographical areas, strengthening traditions in rural areas and modernity in urban areas, as it is something rooted in their own culture and tradition [3], although this implies a constant need for innovation in products and services to provide greater value and thus achieve greater attractiveness in a given location in relation to other destinations [4]. Therefore, local and regional food could give added value to the destination and contribute in this way to the attractiveness of the geographic area[5], and, in this sense, many researchers highlight that each place should promote food as a central attraction to tourists [6] as dining out and trying national and local cuisines are pleasant activities for most tourists. In fact, Cuisine involves a transfer of knowledge and information about the people, culture, traditions and identity of the visited place[8]. Karaikudi cuisine is known internationally for various aspects such as its innovative nature or the quality of the raw material used. In addition, perhaps one of the most recognizable aspects of this Cuisine is the presentation made of the culinary product through the tapa concept which refers to a type of food presentation in small amounts, and it is usually shared among several people even using the same dish. Chettinad Mess is widely known throughout Tamilnadu State, although in some regions they are known by another name, restaurant, for example, and they allow you to taste a small proportion of the typical culinary product of the area along with a drink. In certain geographical areas, the Chettinad Mess that accompanies the drink do not even involve an extra cost for the consumer. Chettinad Mess respond to one of the oldest traditions of road side food stall (Tamilnadu State), and today they are established both as heirs of the culinary tradition of this area and as an avant-garde trend by experimenting with new flavors in the cuisine.

LITERATURE REVIEW

Archana Bhatia (2013) in her article entitled, "SWOT Analysis of Indian Tourism Industry" has analysed

that tourism today is a leisure activity of the masses. Therefore an attempt is made in this research paper to analyze the strengths, weaknesses, 61 opportunities and threats of Indian tourism industry so that the same can be utilized to increase its foreign footfalls. India which is endowed with a treasure of beauty spotsnatural as well as man-made cannot boast of a healthy inflow of foreign tourists. Tourism industry holds a great potential to flourish in India provided its cultural and historical legacy is properly taken care of. Therefore the ministry of tourism can analyze the strengths and weaknesses of Indian tourism industry and also explore the favorable opportunities coming its way and minimize the effects of the threats posed so that Indian tourism industry can be benefitted from it. As the UNWTO highlights have also revealed in their study that there will be a shift in global trend of foreign tourist arrival from advanced economies to emerging economies and India being a part of the latter should therefore be ready enough to grab the fruits of this opportunity coming its way. Amit Birenboim (2011) in their article on "Hotel Location and Tourist Activities in Cities" have concluded that hotel location has a profound impact on tourist movements, with a large share of the total tourist time budget spent in the immediate vicinity of the hotel. Further, this study has illustrated the impact of geomorphic barriers on tourist movements.

Area of the profile

Karaikudi is located in Sivagangai district between Trichy Rameshwaram High road. It got its name because of the famous plant called "Karai" which is widely spread over this area. Earlier it was a small village in Ramanathapuram district. In 1928 it was changed from Panchayat to Muncipal. The people of Karaikudi played a major role during the India freedom struggle.

METHODOLOGY

The methodology used in this research was based on conducting fieldwork to determine the valuation of foreign tourists visiting the city of Karaikudi region on the Cuisine of the city presented through the concept of Chettinad Mess. The surveys were conducted in the establishments selected on two premises: places usually visited by tourists and the selection of dishes and of its cuisine representing the actual Cuisine of the city. The questionnaire was handed to the tourists once they had finished their lunch or dinner. For this reason, talks had been held with the heads of the establishments requesting permission to enter the premises. During the meeting, it was said that the interviewers would seek to avoid any interference with their customer service work.

The survey used in this research is based on various previous works and responds to four aspects: socio-demographic characteristics of tourists, satisfaction of the trip, perception and relationship between culture and Cuisine. Surveys were conducted between the months of June and November 2017. The questionnaire was distributed in two languages (English, tamil) using the method of back-translation. Previously, a pre-test of 20 surveys was conducted to detect possible deviations and errors. The total number of questionnaires obtained was 346. Stratification was performed according to the percentages of foreign tourists visiting the city of Karaikudi region in 2016 and according to data from the State Tourism Department (2017). Among the tourists surveyed, we can highlight those from France (21.5%), Germany (12.1%), the United Kingdom (12.1%), and the United States (9.2%). A convenience sampling was used, this being commonly used in this type of research where respondents are available to be interviewed in a specific space and time. The total number of tourists who stayed in hotels in the city of Sivagangai district in 2017, which is considered as the total study population. The research sampling error was 4.64%. Table 1 shows the technical specifications of the research.

Table 1. Technical details of the research.

Number of foreign tourists (2017)	364,365 people
Sample	446 surveys
Sampling error	+/′ 4.64%
Performance period	June –November 2017
Procedure	Convenience sampling
Sample Control	Implementation and monitoring of fieldwork by the authors of the research

Source: Own explanation.

The data collected were organized, tabulated and analyzed using the SPSS 19.0 program. Data processing was performed through the use of univariate and bivariate statistical tools. Basically, the data, results and

conclusions presented in this article refer to the essential attributes that intervene in tasting Chettinad Mess as a culinary resource, the segmentation of the international tourists from these attributes and the satisfaction that they report from the cooking point of view. To do this, different statistical techniques were used: the factorial analysis, the group analysis, the variance analysis (ANOVA) and finally, the chi-square test derived from the possibility tables between variables.

RESULTS AND DISCUSSION

The aim of this study is to establish different groups of foreign tourists visiting the city of Karaikudi region, in their evaluation of several Descriptive factors of Chettinad Mess as a way of experiencing the typical Cuisine of the city.

Table 2. Descriptive factors regarding the concept of Chettinad Mess.

Descriptive Factor	Denomination
an element of socialization	socialization
to taste different dishes prepared with unique culinary arts	tasting
to use fresh culinary	ingredients
easily digestible food	digestion
a hygienic form of eating	hygiene
a good quality/price ratio	quality/price
The presentation of Chettinad Mess is attractive	presentation
a healthy culinary product	healthy
tradition and Culinary innovation	combination
a reflection of the culture of Karaikudi region	culture

The first group has 78 cases, the second 98 and the third 84 cases. The total number of valid cases was 260 while the number of lost cases was 86.

Coefficient (0.86) reveals, for the different items that comprise this motivation dimension, that it represents a reliable subscale. The importance of this factor alone explains 50.27% of the total variance of the motivation matrix. The second factor extracted, called cultural, and represents an attribute that finds the more traditional and identitarian meaning of the place where the foods and typical dishes are produced. This supports the validity of the local community, a key aspect for the sustainable development of the region. Coefficient (0.79) for this subscale also reveals a good internal consistency. This factor would explain 12.39% of the total variance of the motivation matrix. In addition, the value of the measure of sampling suitability of Kaiser–Meyer–Olkin (KMO) is =0.89 and the Bartlett's test is 1713.53 with a significance level equal to 0.000. Both results indicate that it is appropriate to perform the factorial analysis.

Table 3. Results of factor analysis and reliability on selection attributes.

Items	Factor Loading		Factor
	1	2	
hygiene	0.81		healthy
healthy	0.80		
digestion	0.78		
ingredients	0.70		
presentation	0.68		
quality/price	0.61		
socialization		0.83	Cultural
cultural tasting		0.83	
culture		0.65	
combination		0.58	
Eigen value	5.03	1.24	
% of variance explained	50.27	12.39	
Cronbach's alpha	0.86	0.79	
Kaiser-Meyer = 0.89			
Bartlett test = 1713.53; p = 0.000			
Extraction Method: Principal Component Analysis: Rotation Method			

Source: Own elaboration.

In addition, the cases of homoscedasticity and normality have to be fulfilled in the ANOVA F-statistic. Given that it is not possible to assume that the population variances are equal, the Brown–Forsythe and the Welch statistics were used as an alternative to the ANOVA F-statistic (Table S1). Since the critical level associated with both statistics is less than 0.05, the hypothesis of equality of means can be rejected, and it can be concluded that the averages of the variables of the three compared groups are not equal. For the contrast of the significant differences between the different means, the Games–Howell test was conducted. As for the equality stress tests of means, they are set out in Table S1.

Table 4. Level of satisfaction with the visit to the city of Karaikudi region.

Items	**Group**			**ANOVA**		**Statistic (significance)**
	“cultural” (n = 178)	**“healthy-cultural” (n = 98)**	**“general “ (n = 84)**			
	Mean(*)	**Mean(*)**	**Mean(*)**	**F**	**Sig.**	**Sig**
hygiene	3.76	4.74	2.77	157.361	<0.01	<0.01
healthy	3.66	4.80	2.54	233.971	<0.01	<0.01
digestion	3.62	4.71	2.87	137.011	<0.01	<0.01
ingredients	4.06	4.87	2.83	231.909	<0.01	<0.01
presentation	4.00	4.83	3.17	155.185	<0.01	<0.01
quality/price	4.27	4.73	3.27	117.322	<0.01	<0.01
socialization	3.90	4.59	3.39	43.240	<0.01	<0.01
tasting	4.05	4.76	3.32	90.849	<0.01	<0.01
culture	4.12	4.89	3.18	163.140	<0.01	<0.01
combination	3.92	4.84	2.89	184.772	<0.01	<0.01

(*) The values in bold represent significant differences with at least two of the means of the three groups in ANOVA post-hoc analysis..

Source: Own elaboration

It is the most numerous group with 178 visitors; that is, 49.44% of those surveyed. The second of the groups presents very significant values in all the attribute variables, achieving a very good score in these items: healthy, ingredients, presentation, culture and combination. In this case, it is called healthy-cultural tourist, related to the first factor as well as with the second. It represents the intermediate group in number of visitors (98), which signifies 27.22% of the surveyed. The third of the groups is comprised of 84 visitors (23.33%), being less numerous and the one with the lowest score of all the variables, especially as regards hygiene, healthy, digestion, ingredients. In this case, it is not related to either of the two factors obtained in the factorial analysis. This group can be called general tourist and its relation to the local Cuisine (represented through Chettinad Mess) is merely organic.

In addition, the concept of sustainability is reinforced. In group 2, the element of the cultural heritage (4.89) and the locally produced agricultural products used (4.87) obtain a higher score, delving into the relationship existing between Cuisine, tourism and sustainable development. Furthermore, group 1 presents significant results in both items: culture (4.12) and ingredients (4.06), although less conclusive with respect to group 2. Once the three groups of tourists are established and their relationship with the Cuisine of the city of Karaikudi region through the presentation of Chettinad Mess, three more items are selected: The results of Pearson’s chi-square test indicate that there are statistically significant differences ($p < 0.05$) between the groups when it deals with the following characteristics: age and employment. With respect to the distribution by sex of those surveyed, groups 1 and 2 contain a greater male representation compared to the female, while, in group 3, the proportion is inverted. As for age, group 1 contains the higher percentage of tourists situated between 30 and 49 age (54.80%), while group 3 presents the highest values in the extreme segments: from 16 to 30 age (28.90%) and 60 age and older (16.90%).

Table 5. Socio-demographic characteristics of 3 groups of tourists visiting Karaikudi region.

Socio-Demographic Characteristics		"cultural" (n = 178)	"healthy-cultural" (n = 98)	"general " (n = 84)	Total (%)	Statistics
Gender		100.00	100.00	100.00	100.00	Chi2 = 5.569 p = 0.473
	Male	53.67	56.12	43.37	52.00	
	Female	46.30	43.90	56.60	48.00	
Age		100.00	100.00	100.00	100.00	Chi2 = 20.041 p = 0.010
	Under 30 age	22.60	26.80	28.90	25.20	
	30–39 age	30.50	19.60	20.50	25.20	
	40–49 age	24.30	19.60	9.60	19.60	
	50–59 age	14.10	24.70	24.10	19.30	
	60 age or more	8.50	9.30	16.90	10.60	
Education		100.00	100.00	100.00	100.00	Chi2 = 5.646; p = 0.227
	Primary education	3.40	1.00	1.20	2.20	
	Secondary education	17.10	26.80	19.00	20.20	
	University education	79.50	72.20	79.80	77.60	
Employment		100.00	100.00	100.00	100.00	Chi2 = 21.025; p = 0.021
	Employee	14.60	25.00	113.40	17.10	
	Public Servant	52.60	43.50	35.40	46.10	
	Self-employed	15.20	13.00	14.60	14.50	
	Student	7.00	8.70	18.30	10.10	
	Retired	8.80	9.80	17.10	11.00	
Income		100.00	100.00	100.00	100.00	Chi2 = 7.466; p = 0.487
	Under Rs7000	11.70	12.00	17.60	13.10	
	Rs7000 to Rs10000	9.40	4.30	5.40	7.10	
	Rs10001 to Rs15000	14.00	14.10	16.20	14.50	
	Rs15001 to Rs25000	33.30	29.30	23.00	30.00	
	Over Rs25000	31.60	40.20	37.80	35.30	

Source: Own elaboration.

On the other hand, the educational level of those surveyed particularly stands out: in group 2, 72.20% state they have a university degree, while those that have a secondary education are 26.80%. In the professional category, it is important to point out that, in group 2, the figures of public servant (43.50%) and employee (25.00%) are predominant. In the economic section, for the three groups, there is an elevated concentration (over 60.00%) in the two higher intervals defined for the salary level (more than Rs15001). Specifically, group 2 presents the highest results—over Rs25000 (40.20%).

CONCLUSIONS

The city of Karaikudi region has traditionally been an important cultural destination due to the importance of its historical heritage. In order to complete the tourist experience, in recent years, the typical regional Cuisine has been reinforced, offering tourists the typical culinary dishes of the city. However, in addition, these specialities are being introduced through a concept that defines the Karaikudi cuisine in general and that of the region of Sivaganga district especially—Chettinad Mess. The analysis made has identified two different factors or attributes: healthy and cultural. Based on them, three types of visitors were established—cultural tourist, healthy-cultural tourist and general tourist that are considered as valid and of use for segmenting the market. The cultural tourist is the most numerous

(49.44%) and gets the highest scores on the items related to the cultural dimension (tasting and culture). Next, the healthy-cultural tourist is the most important from the point of view of this research. It groups the second collective of travelers (27.22%) and presents the highest values in all the items, both in the healthy dimension as in that of culture.

Conflict of Interest:- The existence of interest in the food tourism industry, but it has intensified and has been better documented during the past decade, in terms of both knowledge production and dissemination, and of policy formulation and food tourism management.

Source of Funding:- self.

Ethical Clearance:- own interest to develop the food industry

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Screening of Antifungal Activity of *Ganoderma Lucidum* Extract Against Medically Important Fungi

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ABSTRACT

Antimicrobials of plant origin are effective in the treatment of infectious disease while simultaneously mitigating many side effects that are often associated with synthetic antimicrobials. In the present study crude aqueous and ethanolic extract of *Ganoderma lucidum* was evaluated for its antifungal activity against the clinically important fungi namely *Candida albicans, Aspergillus niger, Penicillium marneffei, Cryptococcus neoformans, Trichophyton rubrum,* and *Microsporum canis*. The result showed ethanolic had high inhibitory action against the studies fungus when compared to aqueous extract. In both ethanolic and aqueous extract the maximum inhibition activity was observed against *Candida albicans* followed by *Trichophyton rubrum, Microsporum canis, Aspergillus niger, Penicillium marneffei* and *Cryptococcus neoformans.*

Keywords: *Clinically Important Fungi, Ganoderma lucidum, Inhibition Activity, Aqueous and Ethanolic Extract.*

INTRODUCTION

There is a continuous and urgent need to discover new antimicrobials compounds with diverse chemical structures and novel mechanisms of action for new and re-emerging infectious diseases[1]. Researchers are increasingly turning their attention to folk medicine, looking for new leads to develop better drugs against microbial infections[2]. The increasing failure of chemotherapeutics and antibiotic resistance exhibited by pathogenic microbial infectious agents has led to the screening of several medicinal plants for their potential antimicrobial activity[3,4]. Plant bases antimicrobials have enormous therapeutics potential as they can serve the purpose with lesser side effects that are often associated with synthetic antimicrobials. Herb plays a significant role ameliorating the disease resistant ability and combating against various unfavourable metabolic activities within the living system.

Ganoderma lucidum belongs to the family Ganodermataceae, it is characterized by basidiocarps that are large, perennial, woody brackets also called "conks". The Fungi act as a traditional medicine in many parts of Asia. *Ganoderma lucidum* is a bitter fungus with a glossy exterior and a woody texture[5]. It is commonly referred to as "lingzhi" in China, India and Japan, and it has been used in most Asian countries for the promotion of health and longevity for centuries[6]. It has been used as for its beneficial effects by improving immunomodulatory[7], anti-inflammatory[8], antiviral[9], antitumor[10], antioxidative, and antiaging[11] properties. (Table-1)

The present study was aimed to screen for the aqueous and ethanolic extracts of *Ganoderma lucidum* that could be useful for the development of new tools as antifungal agents for the control of infectious diseases.

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Table 1 : The origin, function and mechanisms of *Ganoderma lucidum* extracts in both Ethanol and Aqueous Extract

Extraction	Origin	Function	Mechanism	References
Ethanol extract of *Ganoderma lucidum* (EGL)	Fruit body	Lifespan elongation activity	Inhibit ROS production, lipid peroxidation, advanced oxidation protein products	12-17
		Immunomodulatory effect	Increase expressions of TLR4 and MyD88	18
		Antioxidant activity	Increase expression and phosphorylation of Nrf2 to induce the upregulation of HO-1	19, 20
Ganoderma lucidum aqueous extract (GLA)	Fruit body	Antioxidant activity	Increase radical scavenging activity and ferric reducing antioxidant power	21
		Anti-neurodegeneration	Inhibit synaptophysin transportation, JNK and p38 signaling pathway to antagonize neuronal apoptosis	22

MATERIALS AND METHOD

Collection of Fungal Material

Ganoderma lucidum

G. lucidum was purchased from MKV organics Ltd. Puducherry, India, It was identified and authenticated by Dr. Kadavul, Botanist, Tagore Govt. Arts and Science College, Puducherry, India.

Preparation of Ethanolic and Aqueous Extracts:

Basidiocarps and fruiting body of *G. lucidum* (100g) was ground to coarse powder, placed in a soxhlet extractor containing 70% ethanol and resulting extract was concentrate in a rotator evaporator under reduced pressure. Aqueous extract were obtained by maceration for 24 hrs. Extract were stored in refrigerator (4ºC) for further use.

Assay of Antifungal Activity:

The fungus *Candida albicans, Aspergillus niger, Penicillium marneffei, Cryptococcus neoformans, Trichophyton rubrum,* and *Microsporum canis* were used in this study were maintained by culturing on Sabouraud Dextrose Agar (SDA) at 28ºC. The antifungal test was performed by employing the oldest method described by yongabi with slight modification[23]. In briefly 500mg of each extract was diluted with the assay medias (100ml). A uniform portion of the test fungi was removed using a 5mm steel borer and aseptically placed on the assay media. All plates were carefully sealed all around with a masking tape to avoid any aerial contaminants and carefully incubated at 28ºC for 7 days. The rate of mycelia growth was measured in mm on 7th day. Ketaconazole (50mg/ml) was used as an experimental positive control, ethanol and water served as the negative control.

CALCULATION

Percentage of Mycillical inhibition = [(dc-dl)/dc] x 100 dc = colony diameter in negative control, d1 colony diameter in extract treatment.

RESULTS

The Studied aqueous and ethanolic crude extracts of *Ganoderma lucidum* had antifungal activities against the studied fungi, but the activity of inhibition varied for the fungi with respect to the type of extract (Table-2). In ethanolic extract maximum inhibition activity was observed against *Candida albicans* (46%) followed by *Trichophyton rubrum* (43%), *Microsporum canis* (39%), *Aspergillus niger* (37%), *Penicillium marneffei* (23%) and *Cryptococcus neoformans* (16%). In aqueous extract maximum inhibition activity was observed

against *Candida albicans* (37%) followed by *Trichophyton rubrum* (35%), *Microsporum canis* (28%), *Aspergillus niger* (26%), *Penicillium marneffei* (22%) and *Cryptococcus neoformans* (06%).

Table 2: Effect of Ethanolic extract and Aqueous Extract of *Ganoderma lucidum*

S. No	Extract	Inhibition Expressed in Percentage					
		Candida albicans	Trichophyton rubrum	Microsporum canis	Aspergillus niger	Penicillium marneffei	Cryptococcus neoformans
1	Ethanolic extract of G.lucidum	46	43	39	37	23	16
2	Aqueous extract of G.lucidum	37	35	28	26	22	06
3	Ketaconazole Control	71	82	69	73	76	80

DISCUSSION

The emergence of antifungal resistant strain of various fungi has promoting research into developing new strategies for fighting fungal infections which may be less toxic to man[24], Both the aqueous and Ethanolic extracts of *G. lucium* showed inhibitory activity against the studied fungus (Table-2), Ethanolic extract showed high inhibitory action against the studied fungus when compared to aqueous extract. Most of the phytochemicals already identified in the medicinal mushroom are reportedly aromatic or saturated organic molecules which make ethanol as an ideal solvent this might be the reason for a better antifungal activity observed in the Ethanolic extract[25], These observations can be rationalized in terms of the polarity of the compounds being extracted by each solvent and, in addition to their intrinsic bioactivity, by their ability to dissolve or diffuse in the different media used in the assay. The inhibitory action if both the extracts observed in the present study might be due to ruptures of the cytoplasmic membrane of the fungal cell which may leads to the damage of intracellular components[26], which however requires to be investigated in detail.

The results of present study supports the traditional usage of the studied plants and suggests that *G.lucidum* extracts possess compounds with antifungal properties that can be used as antifungal agents in new drugs for the therapy of infectious diseases caused by pathogens.

Conflict of Interest: No Conflict of Interest

Source of Funding: Self

Ethical Clearance: Obtained from Institutional Ethical committee

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Study of Infant Feeding Practices in the Urban Slums of Ballari City

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ABSTRACT

Background: Every infant and child has right to good nutrition. One of the important determinants of malnutrition is unscientific infant feeding practices which directly impact the survival of infant in later years of life.

Objectives: To know the prevalence of breastfeeding practices and optimal complementary feeding practices in the Urban slums of Ballari City and factors influencing the same.

Methodology: A cross-sectional study was done in the urban slums of Ballari city. Considering the exclusive breast feeding rate of 44%(according to NFHS 3)the sample size was calculated to be 143 and a total of 150 mothers were included in the study. A total of 6 slums were selected for the study. Within each selected slum a total of 25 mothers of infants were selected randomly from Anganwadi registers. Data was collected by interviewing the mothers on a pre-designed, semi structured proforma.

Results: Optimal breastfeeding practices were assessed where rates of early initiation - 52%, prelacteal feeding - 34%, colostrum feeding – 64% and exclusive breast feeding rate was at 22%. Overall optimal complementary feeding rate was at 18.7%, appropriate time of initiation of complementary feed was at 60.7%, appropriate consistency at 58%, appropriate frequency at 32.7%, appropriate amount at 65.3%

Conclusion: The overall prevalence of excusive breastfeeding (22%) and optimal complementary feeding practices (18.7%) were less when compared to National average. Socio demographic variables like type of family, education, occupation and income and knowledge, attitude and husbands support were having significant influence on infant feeding practices.

Keywords: *Infant feeding practices, Community based cross-sectional study, Ballari.*

INTRODUCTION

Every infant and child has right to good nutrition. One of the important determinant of malnutrition is unscientific infant feeding practices which directly impact the survival of infant in later years of life. Studies have shown that breast-feeding within the first hour of birth decreases neonatal deaths by 22%.[1]

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Exclusive breast-feeding for first 6 months of life prevents morbidity and mortality due to common childhood illnesses such as diarrhoea and pneumonia.[2]

Following the 2001 expert consultation and the 2002 publication of aWHO commissioned systematic review, the global recommendation is that,exclusive breastfeeding is now recommended for the first 6 months of life withthe introduction of complementary feeds thereafter and continued breastfeeding for the first 2 years.[3]

Annually about 26 million babies are delivered in India. According to NFHS -3 data, 20 million are not

able to receive exclusive breastfeeding for thefirst six months and about 13 million do not get good timely and appropriate complementary feeding after six months along with continued breastfeeding. Exclusive breastfeeding up to the age of six months is only 46.3% as per NFHS-3.[4]

On the basis of currently available evidence, the promotion of optimal breastfeeding and complementary feeding practices is clearly the need of the hour. This study will provide insight into the Infant Feeding practices and factors influencing them in urban slums of Ballari City.

OBJECTIVES

1. To know the prevalence of breastfeeding practices and optimal complementary feeding practices in the Urban slums of Ballari City.

2. To study the factors influencing infant feeding practices.

METHODOLOGY

A cross-sectional study design was done in the urban slums of Ballari city. The study population included mothers of infants dwelling in the study area for more than 1 year. The study was conducted from July 2015 to June 2016. Considering the exclusive breast feeding rate of 44% (according to NFHS 3)[4] a sample size of 143 was calculated and a total of 150 mothers were included in the study. Simple Random sampling technique was adapted.

The whole of Ballari city is bisected by the railway line into almost equal parts, within each part of the city 3 slums were selected randomly. A total of 6 slums were selected for the study. They were Mahanandikottam, Renukanagar and Nagalikere in Northern part and Ranipet , D.C Nagar and Cowl bazar in Southern part. Within each selected slum a total of 25 mothers of infants were selected from Anganwadi registers. Mothers with children having developmental delay, congenitalanomalies and any other systemic disorder, Mothers with IDV positive and Mothers with serious disorder(Exp; Psychosis, Lactational failure) were excluded from the study.

Data was collected by interviewing the mothers by a pre-designed, semi structured proforma with specific questionnaires on socio-demographic profile, obstetric profile and immunisation visits by the mother. Indicators like Exclusive breast feeding, early initiation of breastfeeding & complementary feeding indicators like appropriate consistency, appropriate amount, appropriate frequency were used to assess infant feeding practices based on the guidelines of Infant and Young Child Feeding Practices (IYCF) WHO/ UNICEF.[5] The data collected was entered in to a excel sheet and later was analysed by using SPSS version 22. Appropriate descriptive statistics like rates, ratios, percentages were used to describe the simple data.

The study was given ethical approval by Ethical Review Committee of Vijayanagara Institute of Medical Sciences, Ballari. All ethical requirements including confidentiality of identity, responses and informed consent were stringently ensured throughout the project.

RESULTS

Table No 01:

Breast feeding practices			
Practices		**Frequency**	**Percentage**
Early initiation			
	Yes	88	52.0
	No	62	48.0
Pre-lacteal feeding			
	Yes	53	34.0
	No	97	66.0
Colostrum feeding			
	Yes	94	64.0
	No	56	36.0
Exclusive BF for 6 months			
	Yes	35	22.0
	No	115	78.0

Optimal breastfeeding practices were assessed

wherein 52% of the infants were breastfed within one hour of birth, 34% of the infants were given prelacteal feeds, 64% of them were fed with colostrum and only 22% of infants were exclusively breast fed for 6 months. (Table No 1)

Table No 2: Complementary feeding practices

Practices		Frequency	Percen-tage
Appropriate time of initiation			
	Yes	91	60.7
	No	59	39.3
Appropriate consistency			
	Yes	87	58.0
	No	63	42.0
Appropriate frequency			
	Yes	49	32.7
	No	101	67.3
Appropriate amount			
	Yes	98	65.3
	No	52	34.7
Optimal feeding practice			
	Yes	28	18.7
	No	122	81.3

An assessment of optimal complementary feeding practices revealed that around 60.7% of the mothers started complementary feeding of their infants at appropriate time, 58% of infants were fed with appropriate consistency, 32.7% of them were fed with appropriate frequency, 65.3% of them were fed with appropriate amount and the overall prevalence of optimal feeding practices was only 18.7%. (Table No 2)

Table No 3: Socio-demographic profile versus Infant feeding practices

Variable		**Infant feeding practices**	
		EBF* n (%)	**OFP** n (%)**
Age group			
	≤ 20 yrs (n=28)	3 (10.7)	2 (7.1)
	21 - 25 yrs (n=68)	14 (20.6)	12 (17.6)
	26 - 30 yrs (39)	12 (30.8)	11 (28.2)
	> 30 yrs (n=15)	4 (26.7)	3 (20.0)
	P value	0.251	0.183
Religion			
	Hindu (n=106)	24 (22.6)	20 (18.9)
	Muslim (n=36)	7 (19.4)	6 (16.7)
	Christians (n=8)	2 (25.0)	2 (25.0)
	P value	0.902	0.856
Type of family			

***Cont...* Table No 3: Socio-demographic profile versus Infant feeding practices**

	Nuclear (n=96)	16 (16.7)	13 (13.5)
	Joint (n=54)	17 (31.5)	15 (27.8)
	P value	**0.0355**	**0.031**
Education			
	Illiterate (n=26)	1 (3.8)	1 (3.8)
	Primary (n=45)	7 (15.6)	5 (11.1)
	High school (n=61)	17 (27.9)	15 (24.6)
	PUC (n=12)	5 (41.7)	4 (33.3)
	Degree & above (n=6)	3 (50.0)	3 (50.0)
	P value	**0.012**	**0.0143**
Occupation			
	House wife (n=59)	20 (33.9)	7 (11.9)
	Unskilled (n=41)	3 (7.3)	4 (9.8)
	Skilled (n=29)	3 (10.3)	8 (27.6)
	Self-employed (n=15)	6 (40.0)	6 (40.0)
	Professional (n=6)	1 (16.7)	3 (50.0)
	P value	**0.004**	**0.0071**
Income of the family			
	APL (n=72)	22 (30.6)	17 (23.6)
	BPL (n=78)	11 (14.1)	11 (14.1)
	P value	**0.015**	**0.135**

*EBF- Exclusive Breast Feeding

**OFP- Optimal complementary Feeding Practices.

The prevalence of EBF and OFP were higher among the infants belonging to joint family (31.5% and 27.8% respectively), the prevalence also increased with increase in literacy status of the mothers. House wives and self employed mothers showed higher prevalence of EBF and OFP. Infants belonging to APL family had a higher prevalence of EBF and OFP and all these results were found to be statistically significant. (Table No 3)

Table No 4: Child and Obstetric profile versus Infant feeding practices

Variable		**Infant feeding practices**	
		EBF n (%)	**OFP n (%)**
Age at marriage			
	< 18 yrs (n=18)	3 (16.7)	2 (11.1)
	> 18 yrs (n=132)	30 (22.7)	31 (23.5)
	P value	**0.561**	**0.235**
Age at first delivery			
	< 21 yrs (n=34)	5 (14.7)	4 (11.8)

Cont... **Table No 4: Child and Obstetric profile versus Infant feeding practices**

	> 21 yrs (n=116)	28 (24.1)	24 (20.7)
	P value	**0.243**	**0.241**
Spacing of births			
	< 2 yrs (n=42)	5 (11.9)	5 (11.9)
	> 2 yrs (n=70)	20 (28.6)	18 (25.7)
	NA (n=38)	8 (21.1)	5 (13.2)
	P value	**0.117**	**0.115**
No. of < 5 yr children in the family			
	Nil (n=21)	6 (28.6)	3 (14.3)
	< 2 (n=65)	16 (24.6)	12 (18.5)
	≥ 2 (n=64)	11 (17.2)	13 (20.3)
	P value	**0.437**	**0.826**
Regular ANC/PNC/immunisation visits			
	Yes (n=93)	26 (28.0)	22 (25.0)
	No (n=57)	7 (12.3)	6 (9.7)
	P value	**0.024**	**0.017**
Gender of child			
	Male (n=78)	16 (20.5)	15 (23.8)
	Female (n=72)	17 (23.6)	13 (22.0)
	P value	**0.647**	**0.853**
Birth order			
	First (n=38)	6 (15.8)	4 (11.8)
	Second (n=94)	25 (26.6)	20 (27.0)
	Third & above (n=18)	2 (11.1)	4 (28.6)
	P value	**0.196**	**0.327**

Assessment of child and obstetric profile revealed that mothers who had regular ANC/PNC checkups and infants who gave regular immunisation visits had a higher prevalence of EBF and OFP (28% and 25% respectively) and this result was found to be statistically significant.

However age at marriage, age at first delivery, spacing of births, gender of the child and birth order did not have a significant influence on EBF and OFP.

Table No 5:

Mothers perception versus Infant feeding practices			
Variable		**Infant feeding practices**	
		EBF n (%)	OFP n (%)
Knowledge levels			
	Adequate	28 (31.8)	16 (30.8)
	Inadequate	5 (8.1)	12 (12.2)
	P value	**< 0.001**	**0.005**

Cont... **Table No 5:**

Attitude			
	Positive attitude	29 (31.9)	22 (23.9)
	Negative attitude	4 (6.8)	6 (10.3)
	P value	**< 0.001**	**0.037**
Husband support			
	Yes	22 (37.9)	15 (28.3)
	No	11 (12.0)	13 (13.4)
	P value	**< 0.001**	**0.025**

Assessment of mothers perception to infant feeding practices revealed that those mothers who had adequate knowledge had a higher prevalence of EBF and OFP (31.8% & 30.8% respectively). Those mothers who had a positive attitude about feeding practices showed a higher prevalence of EBF and OFP (31.9% & 23.9% respectively) and was also higher (37.9% & 28.3% respectively) in the infants of those mothers who had their husband's support.

DISCUSSION

The urban poor constitute the fastest growing section of the population with millions of babies being born annually. Feeding practices of children among urban poor is far from satisfactory which leads to various conditions of ill health and malnutrition.[6]

In this study, Infant feeding practices of 150 infants were assessed in the urban slums of Ballari City, Karnataka. Infant feeding practices includes two components- optimal breast feeding and optimal complementary feeding practices.

An assessment of optimal breast feeding practices were studied, where in early initiation of breast feeding was observed in 52%. In another study done in urban slums of Kolkata by Sima Roy et al revealed that only 16.7% of the mothers initiated early breast feeding which is comparatively less from our study results.[7] Similar low rates 15% were also found in a study done by Prerna S et al in Meerut.[8]

When we look at the National average, trends from last two rounds of NFHS there is a rise of 18.2 points in the percentage of early initiation of breastfeeding (NFHS4- 41.6% & NFHS3-23.4%).[4,9]Various Studies done in rural areas of India reported high percentage of mothers initiating breast feeding within 1st hour of birth like our study findings.[8,9]

However another study conducted in rural areas of Ballari found that 58.7% of mothers initiated breast feeding within 1 hour,[10] which is slightly higher than the present study, the reason might be the neglected behaviour and lack of awareness regarding infant feeding practices in the Urban slums.

Prelacteal feeds is the main source of infection to the newborn which was given in 34% of newborns in this study which is high compared to study done in urban slums of Kolkata (29.2%)[7], Bangalore (19%)[11], Western Nepal (23.3%)[12]but low compared to study done in a rural area of North Karnataka (66%).[13]

The practice of colostrum feeding was observed in 64% of the newborns which is lower compared to study done in similar setting of Kolkata (90%)[7]and higher compared to studies done in urban slums of Delhi (50%)[14] and Mumbai (50%).[15]

The IYCF guidelines recommends breastfeeding for the first six months of life and then supplemented breastfeeding up to the age of two years or beyond.[5] An assessment of EBF in the present study showed that only 22% of the mothers breastfed their new-borns exclusively for 6 months which is comparable to study done in Kolkata (28.3%),[7] and lower compared to studies done in urban slums of Delhi (35.2%)[14] and Meerut (38.3%).[8]

There is a 5.7% rise in the percentage of EBF in the last two rounds of NHFS (NFHS4-52.1% & NFHS3-46.4%)[4,9]. EBF rates in our study was lower compared to National average of exclusive breast feeding (46.4%) according to NFHS 3[4].

Optimal complementary feeding practices were assessed based on the IYCF guidelines which revealed that around 60.7% of the mothers started complementary feeding of their infants at appropriate time which was

higher than the national average (53%) according to NHFS 3 but lower compared to the studies done in Kolkata (71.7%)[7], Mumbai (82.5%)[15] and Mangalore, Karnataka (77.5%)[16].

In the present study 58% of infants were fed with appropriate consistency, 32.7% of them were fed with appropriate frequency, 65.3% of them were fed with appropriate amount and the overall prevalence of optimal complementary feeding practices was only 18.7%. Whereas a study done by Prerana S et al in Meerut revealed a higher percentage of optimal feeding practices 33.9% where 43.4% were fed with appropriate frequency and 37.7% with appropriate amount.[8]

Socio demographic factors like infants living in joint family, higher education of the mother, infants belonging to APL families and mothers who received regular ANC/PNC checkups were significantly associated with good infant feeding practices in the present study. Assessment of mothers perception to infant feeding practices revealed that those mothers who had adequate knowledge, positive attitude and husband's support showed higher prevalence of infant feeding practices compared to those who did not.

Therefore going through various other studies it is very much clear that the rates of breast feeding and optimal complementary feeding practices are determined and governed by various socio-cultural factors prevailing in their respective geographical areas and urban slums being most neglected areas, behavioural change and awareness regarding the availability of health services is the need of hour.

CONCLUSION

The overall prevalence of exclusive breastfeeding (22%) and optimal complementary feeding practices (18.7%) were less when compared to National average. Socio demographic variables like type of family, education, occupation and income and knowledge, attitude and husbands support were having significant influence on infant feeding practices.

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Exploratory and Confirmatory Factor Analysis of an Urdu-version of the Summary of Diabetes Self-care Activities Measure (U-SDSCA)

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ABSTRACT

Purpose: The English version of the Summary of Diabetes Self-Care Activities (SDSCA) measure is the most widely used self-reporting tool assessing the diabetes self-management. This study is aimed at conducting the exploratory and confirmatory factor analysis of an Urdu version of the summary of diabetes self-management activities measure.

Method: The Urdu version of SDSCA which was obtained following forward and backward translation of English version of SDSCA, was used for the purpose of exploratory and confirmatory analysis. The exploratory and confirmatory factor analysis were carried out on the large sample (n=200) of type 2 diabetic patients to explore the factors associated with the differences in diabetes self-management approach in the middle-aged population of rural area of Pakistan.

Results: The exploratory factor analysis showed statistically significant interrelationship (95% level of significance, $\alpha = 0.05$, p-value < 0.001) between the variables of the Urdu version of the summary of diabetes self-care activities measure (U-SDSCA). The confirmatory factor analysis resulted in a good fit of the model with chi-squared = 48.9, CFI=0.94, TLI=0.95, RMSEA = 0.065, SPMR = 0.068. Once the items related to special diet with low factor loadings of 0.03 and 0.18 were removed from the analysis, the model was improved in terms of the chi-squared value (30.895) and the relevant model fit indices (CFI= 0.98, TLI=0.989, RMSEA = 0.045, SPMR =0.048).

Conclusion: This study provided evidence for reliability and validity of Urdu Summary of Diabetes Self-Care Activities (U-SDSCA) instrument which can be administered to type 2 diabetic patients of rural area of Pakistan to assess their diabetes self-management activities. The exploratory factor analysis provided excellent results and confirmatory factor analysis resulted in a good fit of the model.

Keywords: *Type 2 diabetes, Self-management, Urdu SDSCA, Exploratory and confirmatory Analysis, Instrument*

INTRODUCTION

The middle-aged population of Pakistan is suffering with the onslaught of type 2 diabetes because people are overweight or obese, have unhealthy eating habits and lack of physical activity making their health problem more complicated[1,2]. In order to answer an important question related to self-management of type 2 diabetes and the challenges these people are facing in their day to day life, a valid and reliable instrument, which assesses self-management behaviours in patients with diabetes, is required[3-6].

Toobert et al.[7] developed the English version of the Summary of Diabetes Self-care Activities (SDSCA) measure which is frequently used instrument in English

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speaking countries to assess the self-management activities. The questionnaire is an 11 items self-reporting tool assessing levels of self-care in patients with diabetes. There are several studies in literature which have evaluated the SDSCA and shown satisfactory psychometric properties[7] but there is no psychometric validated instrument to date in Pakistan to assess self-management of type 2 diabetes. It was indicated by Mumtaz et al.[8] that they used an Urdu version of SDSCA in their study but they did not provide details on the psychometric evaluation and validation of the instrument and exploratory and confirmatory factor analysis were not used in their study addressing the sub-scales of the instrument.

The English version of SDSCA instrument has been widely used in diabetes-related studies[9] and was translated into Chinese by Xu et al.[10], Spanish by Vincent et al.[11], Arabic by Al-Johani et al.[12], German by Kamradt et al.[13] and Urdu by Ansari et al.[14] The English version of SDSCA questionnaire was developed by Toobert et al.[7] in two parts. The first part contains essential questions related to self-management of diabetes and the second part contains several sub-scales that explore health-care provider interventions with regard to diet, exercise, blood glucose testing, and medication.

The first part consists of 10 questions about self-care activities, which consist of five sub-scales or domains: diet (4 questions), exercise (2 questions), blood glucose testing (2 questions), and foot care (2 questions). The one question related to smoking was not considered in this study as it does not use the standard scale of the instrument. So, the revised version of U-SDSCA composed of 10 items for the exploratory and confirmatory factor analysis study. The aim of this study is to use the validated Urdu version of the SDSCA (U-SDSCA) instrument and to conduct the exploratory and confirmatory factor analysis on the large sample (n=200) of type 2 diabetic patients to understand the factors associated with the differences in diabetes self-management activities in the middle-aged population of rural area of Pakistan.

MATERIAL AND METHOD

Participants

The sample of participants was purposively recruited from the medical clinic of Al-Rehman Hospital, Pakistan which provides primary health-care services, including the management of chronic diseases such as diabetes. Initially about 250 patients were approached and 200 patients agreed to participate in the study.

Sample Size

The purposive sample of 200 patients was selected to establish the construct validity (factor analysis) of the U-SDSCA instrument to further understand the factors associated with differences in diabetes self-management in the middle-aged population of rural area of Pakistan. The sample size for factor analysis is subject to interpretation.

For example: Bryant and Yarnold[15] suggested that the subjects-to-variables (STV) ratio should not be lower than five, while Hatcher[16] suggested that the sample size of 100 should be the minimum number needed for factor analysis. Graeme and Sofroniou[17] proposed a sample of 150-300; Gorsuch[18] indicated a sample size of 200 and Norušis[19] suggested a sample size of 300. Since there is no universal agreement on the number of participants required to run factor analysis[20], based on the review of the literature and the number of items in the U-SDSCA instrument a priori decision was made that a sample of 200 people or more would satisfy the statistical requirements of the procedure.

Procedure

The participants (n=200) recruited were asked to complete the questionnaire following their informed consents. The study was approved by the ethics committee of University of New South Wales, Australia and by the Ayub Medical Institution, Pakistan. Most participants completed the questionnaire in the medical clinic waiting room of the facility.

Statistical Analysis

The statistical analysis was carried out using IBM SPSS version 21 software. Ansari et al.[14] performed the Psychometric evaluation and validation of this Urdu version of the summary of diabetes self-care activities measure (U-SDSCA) which has shown acceptable psychometric properties throughout a consecutive reliability and validity evaluation including: split-half reliability coefficient 0.90, test-retest reliability (r = 0.918, p = < 0.001), intra-class coefficient (0.912) and Cronbach's alpha (0.79)[14].

In this current study, the authors performed exploratory factor analysis using Principle Component Analysis (PCA) techniques to extract factors with an Eigenvalue criterion of 1. The factor loadings were obtained using Varimax rotation method. The Kaiser-Meyer Olkin (KMO) method was used to measure the sampling adequacy. The Bartlett's test of sphericity was used to test the identity of correlation matrix. The confirmatory factor analysis was performed using IBM AMOS version 24 to assess the model fit defined by the four latent factors diet (item 1 - item 4), exercise (item 5 and item 6), blood glucose testing (item 7 and item 8) and foot care (item 9 and item 10) using the Structured Modelling Equation (SME).

RESULTS

The mean age of the 200 participants was 52 years (Range: 40-65 years). 100 participants were male (50%) and 100 participants were female (50%) and the mean duration of time since diagnosis of Type 2 diabetes was 8 (Range: 2-13 years). The medical record accessed from the medical centre of the hospital showed the higher values of HbA1c (9%) for both men and women patients ranging between (2 to 13) %. The mean value of the body mass index (BMI) was 29 Kg/m^2. All the participants shown great interest and completed the questionnaire during their visit at the medical centre of the hospital. Table 1 provides the details on the patient's characteristics.

Table 1: Patient's Characteristics

Demographic	*Men (n = 100)*	*Women (n = 100)*	*Total (n = 200)*
Age (average, in years)	51	53	52
Marital Status			
Single/never married	15	5	20
Married	75	85	160
Separated/divorced	10	2	12
Widowed	0	8	8
Education			
Less than grade 9	16	50	66
completed high school	65	40	105
completed college degree	10	7	17
Graduate/professional degree	9	3	12
Employment			
Full/part-time, self-employed	75	65	140
Unemployed	10	35	45
Retired	15	0	15
Type 2 diabetes duration			
< 8 years	36	42	78
>= 8 years	64	58	122

Exploratory Factor Analysis (EFA)

The exploratory factor analysis was carried out with the larger sample (n=200) to identify the agreement between the theoretical concept of self-management and the U-SDSCA measure. Stratton et al.[21] suggested that this type of analysis is required to verify clustered items under each sub-scale of an instrument. Completing the exploratory factor analyses in this stage entails assessing the suitability of the data by inspecting the correlation matrix and applying the Kaiser-Meyer-Oklin test, and Bartlett's test of Sphericity[22]. In addition, identifying retained factors from the Principal Components Analysis was mainly based on the indication of the parallel analysis as recommended by Field[23].

Test Adequacy of Sample

The Kaiser-Meyer Olkin is the measure of sampling adequacy, which varies between 0 and 1. The values closer to 1 are better and the value of 0.6 is the suggested minimum value.

Bartlett's Test of Spheircity

The Bartlett's test of sphericity is the test for null hypothesis that the correlation matrix has an identity matrix. Taking into consideration, these tests provide the minimum standards to proceed for factor analysis.

Test Hypothesis

Null Hypothesis H_0: There is no statistically significant interrelationship between the variables of the

Urdu version of the summary of diabetes self-care activities measure (U-SDSCA).

Alternate Hypothesis H_1: There may be a statistically significant interrelationship between the variables of the Urdu version of the summary of diabetes self-care activities measure (U-SDSCA).

Correlation Matrix

The first step is to check the suitability of the data for factor analysis by examining the correlation matrix of the 10 items of the instrument scales. The correlation matrix revealed the presence of several correlation coefficients as shown in Table 2. The lowest correlations were evident between the items 4 and 5 and items 4 and 6, with coefficients of -0.035 and -0.048 respectively. It can be seen from the Table 2 that the largest correlations were between items 1 and 2 (.810) and items 7 and 8 (.873).

Table 2 The Correlation Matrix

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9
Item 2	.810								
Item 3	.312	.340							
Item 4	-.321	-.323	-.045						
Item 5	.283	.271	.256	-.035					
Item 6	.290	.235	.180	-.048	.812				
Item 7	.340	.310	.198	.117	.134	.174			
Item 8	.310	.265	.278	.103	.168	.189	**.873**		
Item 9	.332	.269	.345	-.189	.082	.286	.358	.240	
Item 10	.318	.279	.384	-.295	.187	.271	.219	.298 .	687

The Kaiser-Meyer Olkin and Bartlett's test measure of sampling adequacy was used to examine the appropriateness of exploratory factor analysis for 10 items in the correlation matrix. The approximate chi square was 875.983 with 58 degrees of freedom, which is significant at 0.05 level of significance. Table 3 shows the Kaiser-Meyer-Oklin test value which is 0.68 satisfying the recommended value of 0.60. Also, Bartlett's test of sphericity reached statistical significance supporting the reliability of the correlation matrix.

Table 3 The Kaiser–Meyer-Oklin and Bartlett's test of sphericity (10 items)

KMO and Bartlett's Test			
Kaiser–Meyer-Oklin Sampling freq.	Bartlett's test of sphericity	Df	p-value
.684	Chi Square = 875.983	58	.000

Taking a 95% level of significance, $\alpha = 0.05$, the p-value (Sig.) of $.000 < 0.05$, therefore the factor analysis is valid. As $p < \alpha = 0.05$, we therefor reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1) that there may be a statistically significant interrelationship between the variables of the Urdu version of the summary of diabetes self-care activities measure (U-SDSCA).

This 10 items analysis loaded 5 factors with eigenvalues greater than 1 that explained 89.55 % of total variance as shown in Table 4 All items loaded in their respective sub-scales except for items 3 and 4 (special diet). Item 3 loaded in the first factor corresponding to items 7 and 8 (blood glucose testing) sub-scale and item 4 loaded in a separate factor.

Table 4 Results of exploratory factor analysis of Urdu-SDSCA version (10 items): factor loadings and explained variance

Components	1	2	3	4	5
Item 1 Item 2			.979 .989		
Item 3	.784				
Item 4					.973
Item 5		.989			
Item 6		.980			
Item 7	.894				
Item 8	.879				
Item 9				.832	
Item 10				.847	
Eigenvalues	2.623	2.032	1.436	1.125	1.236
% of variance	28.56	28.36	23.45	18.96	16.82
Cumulative % of variance	27.46	45.90	65.73	79.37	**89.55**

The Figure 1 provides a scree plot between the eigenvalues and the number of components (ref. table 4). The number of factors to be retained is the data points that are above the break which is called the point of inflexion. This plot demonstrates that the special diet items 3 and 4 which were not loaded properly to their respective scales are below the point of inflexion and should not be retained during exploratory factor analysis.

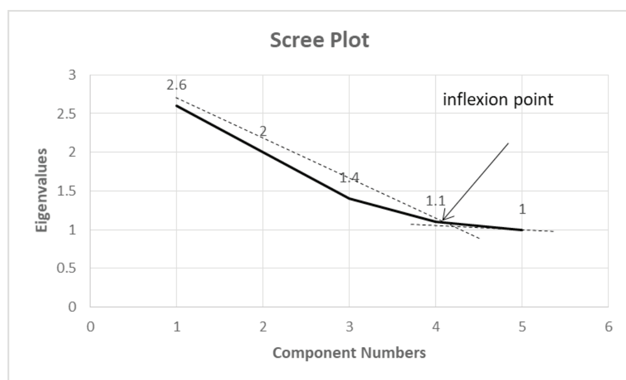

Figure 1 The scree plot of eigenvalues

The 8 items exploratory factor analysis was carried out removing the 2-items related to special diet subscale due to their weak performance in the previous analysis and their weak internal consistency. The Kaiser-Meyer-Oklin test value was 0.6 and Bartlett's test of sphericity was statistically significant ($p < 0.001$) as shown in Table 5. This analysis loaded 4 factors in their respective scales that explained 90.3% of total variance as shown in Table 6.

Table 5 The Kaiser –Meyer-Oklin and Bartlett's test of sphericity (10 items)

KMO and Bartlett's Test			
Kaiser–Meyer-Oklin Sampling freq.	Bartlett's test of sphericity	Df	p-value
.600	Chi Square = 855.783	48	.000

Table 6 Results of exploratory factor analysis of Urdu-SDSCA version (8 items): factor loadings and explained variance

Components	1	2	3	4
Item 1 Item 2		.977 .989		
Item 5	.989			
Item 6	.993			
Item 7			.947	
Item 8			.943	
Item 9				.843
Item 10				.852
Eigenvalues	2.156	2.546	1.745	1.696
% of variance	26.70	26.75	22.45	19.96
Cumulative % of variance	25.90	45.94	81.73	**90.30**

Confirmatory Factor Analysis (CFA)

The confirmatory factor analysis was performed using IBM AMOS 24 to assess the model fit defined by the four latent factors diet (item 1 - item 4), exercise (item 5 and item 6), blood glucose testing (item 7 and item 8) and foot care (item 9 and item 10) using the structured modelling equation. A CFA model is considered a good fit if Cumulative Fit Index (CFI), Tuker-Lewis Fit Index (TLI), Incremental Fit Index (IFI) values are greater than 0.90, Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR) is less than 0.08[24].

The confirmatory analysis resulted in a good fit of the model 1 as shown in Figure 2 with chi-squared = 48.9, CFI=0.94, TLI=0.95, RMSEA = 0.065, SPMR = 0.068. The model in Figure 2 displays the latent variable correlations, standardized parameter estimates and squared multiple correlations. This may be observed from Figure 2 that item 3 and item 4 related to special diet have low factor loadings of 0.03 and 0.18 respectively, thus making their contribution less significant to the model fit. This was also observed by Kamradt et al.[13] during the confirmatory factor analysis of German SDSCA instrument evaluation. Therefore, these items were removed from the CFA Model 1 and CFA analysis was carried out second time as shown in Figure 3 (CFA Model 2). In CFA model 2, the Chi-squared of the model is 30.895, degrees of freedom =20 and p-value = 0.098. The model fit indices of this model are CFI= 0.98, TLI=0.989, RMSEA = 0.045, SPMR =0.048. The model has improved in terms of both the chi-squared value and the relevant model fit indices.

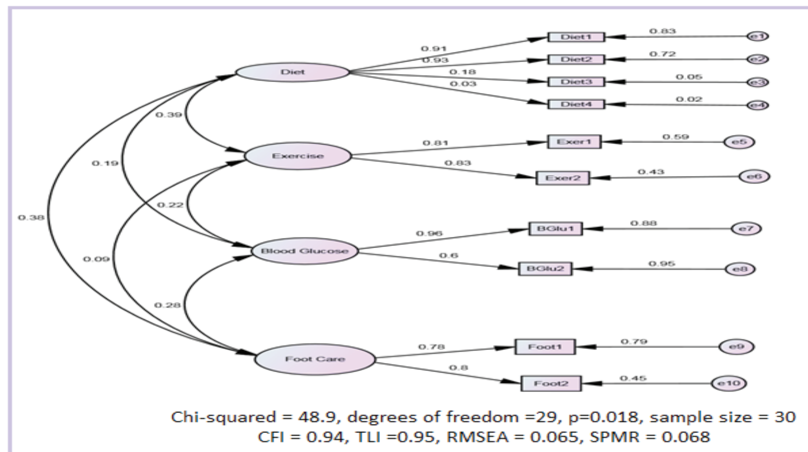

Figure 2 CFA model 1: Testing factor structure of the summary of diabetes self-care activities measure of Urdu-SDSCA (with 10 items)

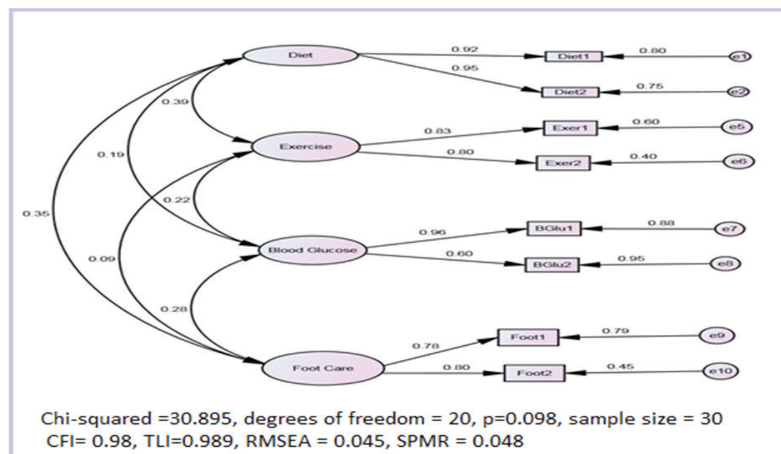

Figure 3 CFA model 2: Testing factor structure of the summary of diabetes self-care activities measure of Urdu-SDSCA (with 8 items)

DISCUSSION

The Urdu-version of the SDSCA (U-SDSCA) shown acceptable psychometric properties in relation to validity and reliability which can be used in the population of rural area of Pakistan[14] The properties of Urdu version are also comparable to the original version of SDSCA[7]

and these finding suggest that the Urdu version is suitable for assessing self-management in patients with type 2 diabetes in the middle-aged population of rural area of Pakistan.

The exploratory factor analysis showed statistically significant interrelationship (95% level of significance, $\alpha = 0.05$, p-value < 0.001) between the variables of the Urdu version of the summary of diabetes self-care activities measure (U-SDSCA). The confirmatory factor analysis (CFA) revealed low factor loading for item 3 and item 4 related to special diet which is in line with previous findings by Kamradt et al.[13]. A further CFA was conducted after removing the special diet items from the model and the results showed improvements regarding the χ^2 of the model as well as the relevant model fit indices. In general, the correlations between factors ranged from low to moderate, which appears to reflect again that diabetes self-management includes several independent aspects and supports previous findings[13].

The findings in this study underline the multidimensional construct of diabetes self-management with independent aspects of self-care activities. These results correlate fairly with previous findings[7,13]. Of particular mention is the diet which seems to have various components, which are not highly correlated in the analysis. Therefore, the results of this study appear to reflect, that type 2 diabetes patients did not fully link their eating habits with their disease, especially in regard to high fat and oily rich food served in most of the families in Pakistan.

Toobert et al.[7] suggested that specific eating habits may be assessed separately. However, the present findings highlighted the possible suggestion of omitting item 3 and item 4 of the U-SDSCA to improve its psychometric properties as a reliable and valid tool assessing self-management of type 2 diabetes in the rural area of Pakistan.

Strengths and Limitations

The main strength of the study is that the larger sample (n=200) was adequate to identify the agreement between the theoretical concept of self-management and the U-SDSCA measures and helped to obtain good model which can be used for further research assessing the self-management of type 2 diabetes in the population of Pakistan.

The limitation of this study as well as other studies measuring the self-management is the lack of "gold standard" comparison[25]. The reason may be that the measurement of self-management of diabetes poses difficulties because of the various aspects that are inherent within this concept[13].

CONCLUSIONS

The exploratory analysis provided excellent results and confirmatory analysis resulted in a good fit of the model. Therefore, the current Urdu Summary of Diabetes Self-Care Activities (U-SDSCA) instrument is suitable to measure self-management practices among the middle-aged population of rural area of Pakistan in the context of current study. This study provides a validated instrument which can be used by clinicians and researchers to help advance healthcare practices and research for diabetes management.

Abbreviations

SDSCA: Summary of Diabetes Self-care Activities; U-SDSCA: Urdu-version of Summary of Diabetes Self-care Activities; STV: Subject to Variables; SPSS: Statistical Package for the Social Sciences; PCA: Principle Component Analysis; KMO: Kaiser-Meyer Olkin; SME: Structured Modelling Equation; BMI: Body Mass Index; EFA: Exploratory Factor Analysis; CFA: Confirmatory Factor Analysis; CFI: Cumulative Fit Index; TLI: Tuker-Lewis Fit Index; IFI: Incremental Fit Index; RMSEA: Root Mean Square Error of Approximation; SPMR: Standard Root Mean Square Residual.

Declarations

Ethics and consent to participate: The study was approved by the ethics committee of University of New South Wales, Australia (ref: HC16882) and by the Ayub Medical Institution of Pakistan.

Competing Interest: The authors declare that they have no competing interest in this research work and no funding was received.

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Preparedness of Dental Students to Manage Medical Emergencies in Clinical Dental Set-up: A Cross-sectional Questionnaire Survey

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ABSTRACT

Background: Medical emergencies are inevitable in clinical dental set-up. They put the well-being of patients at risk. If addressed properly, severity of such episodes can be brought down significantly. So the aim of this study was to assess the preparedness of dental students to manage medical emergencies in dental clinics.

Materials and method: This cross-sectional survey was done among 147 graduate and postgraduate students of a dental college in South India. The participants filled self-administered questionnaire consisting of 23 close-ended questions. Descriptive analysis using Chi-square test was done to compare two groups. P-value of <0.05 was considered as statistically significant.

Result: Amongst 147 participants, around three-fourth of study participants have encountered medical emergency during clinics. Around three-fourth of students has received theoretical training but still majority of participants feel they are incompetent to handle medical emergencies. Most of them are willing to undergo proper training to handle medical emergencies and also support the addition of separate ALS and BLS course.

Majority of PGs and three-fourth graduates knew how to perform BLS, CPR but administration of IM, IV and SC injections were known to less than one-third of students.

Conclusion: Dental professionals should be confident and prepared to deal with medical emergencies arising during their practice. Reforms in dental curriculum and thorough training of dental students at an initial stage will help to increase their confidence and competence to deal with medical emergencies.

Keywords: *Medical emergencies, dental interns and PGs, competence, curriculum*

INTRODUCTION

Medical emergencies are inevitable in clinical dental set-up. They put the well-being of patients at risk. These emergencies present critical scenario which should be addressed immediately and adequately.[1] But many studies across the globe suggest that dental graduates may not be adequately prepared to handle them.[2-6]

The lack of ability to handle medical emergencies among dental students can be attributed to the curriculum which fails to provide students with adequate training required to tackle such situations. Though texts regarding "handling of medical emergencies" are presented to the dental students, but they fail to inculcate the required skill as these are taught only superficially without thorough practical training.[2,7] Thus, making the students less confident to handle medical emergency.

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If addressed properly, the severity of such episodes reduce by remarkable degree. Thus, this study aims to assess the preparedness of dental students to manage medical emergencies in dental clinics.

MATERIALS AND METHOD

The descriptive, cross-sectional survey was carried out among 147 students, which included graduates and post graduate students of dental college in South India. It assessed the knowledge, attitude and competence to handle medical emergencies in clinical setup among dental students.

The study population was selected as they handle more number of patients in the clinics and have been taught about medical emergencies and its management as a part of their curriculum. The participation was voluntary and the identity was kept confidential. Informed consent was obtained prior to filling the questionnaire. Before conducting study, permission was sought from Head of the Institute. Ethical clearance was also obtained from Institutional Ethical Committee.

A self- administered questionnaire consisting of 23 close-ended questions spread out over 3 sections was used. The demographic details of participants were also collected. First section comprised of 9 questions dealing with knowledge about medical emergencies among dental students. [1,8,9] The second section comprised of 6 questions regarding attitude towards handling of medical emergencies. A 5-point Likert scale was used to assess the response of participants. Last section had 8 questions assessing self-perceived competence of participants about basic procedures that aid in handling medical emergencies. [8]

The data collected was subjected to descriptive analysis using SPSS version 20. Chi-square test was used to compare two groups and p-value of <0.05 was considered as statistically significant.

RESULT

Amongst the one hundred forty seven participants, 78 were interns and 69 were post- graduates (PGs). Approximately two-third of participants were female in both the groups (Table 1).

Table 2 illustrates knowledge of dental students about handling of medical emergencies, where majority of participants (91% interns & 88.4% PGs) knew how to diagnose medical emergency. A significantly higher percentage of PGs knew about emergency drugs and materials which precipitate allergic reaction, as compared to interns. Although, approximately same number of interns and PGs have encountered medical emergency in clinics, only 66.7% PGs asked for assistance whereas 78.8% of interns asked for assistance during emergency. Even though, majority of study population has received theoretical training for handling medical emergencies but only around one-fourth of study population has practical training for handling medical emergency. Majority of the participants have inadequate training to handle medical emergencies and the major cause for this inadequacy was lack of time. Most participants were willing to undergo proper training to handle medical emergencies.

Table 3 demonstrates the attitude of dental students towards handling of medical emergencies. Most of the participants strongly agreed that all dental professionals should be well versed with knowledge of handling medical emergencies. Around 90% of participants were in favor of addition of a separate ALS and BLS programme to the present dental curriculum. 80.8% interns and 92.8% PGs strongly agreed that stress reduction protocol must be followed for patients with relevant medical history. Recording of vitals and thorough medical history before any dental procedure has been strongly agreed upon by approximately 90% of PGs and 80% of interns.

Table 4 shows the self-perceived competence about few basic procedures that aid in handling medical emergencies among the participants. Around three-fourth interns knew how to perform BLS, CPR and artificial respiration as compared to PG(92%) most of whom knew how to do it. This difference between two groups is statistically significant. A meager 20% (approx) interns knew how to administer intramuscular, intravenous and subcutaneous injections. Among PGs, 36.2% knew administration of intramuscular injection, 40.6% knew intravenous and 32.4% knew subcutaneous injection administration. 56.4% interns and 68.1% PGs knew how to perform Heimlich manoeuvre. A higher percentage (76.8%) of PGs knew how to check carotid pulse as compared to the interns (59%) and this difference was statistically significant (p-value = 0.023).

DISCUSSION

During dental procedures, medical emergencies have been frequently reported.[10-12] Dental graduates and post graduates have to deal with large number of patients and are likely to encounter medical emergencies during their practice. Although, according to a study upto 44% of dentists may encounter a medical emergency in a year [13], the present study shows that around three-fourth of the study participants have encountered medical emergency during their practice. Also, significantly higher number of PGs has knowledge about emergency drugs and materials precipitating allergic reactions in patients, as compared to interns. This can be attributed to the higher level of clinical experience and expertise of PGs. Although, the result of this study shows that PGs are better trained and more confident about handling of medical emergencies as compared to interns, still both the groups lack adequate skill, training and knowledge to handle medical emergencies efficiently.

In the present study, though most of participants have received theoretical training to handle medical emergency, but they lack practical training. A study conducted by Ehigiator et al.[9] among Nigerian dental students showed that 8.1% of the participants had received only practical training, 21.8% had received only theoretical training, 28.2% had received both type of training whereas 41.9% had received no training at all. This could be one of the reasons for the lack of understanding and ability to handle medical emergency. Also, a study by Shenoy et al. [8] showed poor understanding of medical emergencies among young dental graduates of dental school and hospital in Mangalore. Birang et al. [14] in their study showed that the knowledge score of Esfahan dentists was 5.42/10. Jodalli et al. [12] stated that although theoretical training has been received by the study group but they are not confident to treat emergencies and may require further practical training.[2,4,6,13,15] Result of various studies suggest revision of dental curriculum to lay more and equal amount of emphasis on both theoretical and practical training .

This study showed that the self-perceived competence of participants regarding the common procedures like BLS, CPR and artificial respiration was good but it was not of an acceptable level when discussing about procedures like IM, IV and SC injection administration. A study by Shenoy et al. [8] showed that only 37.5% knew how to perform CPR, among young dental graduates of a dental school and hospital in Mangalore. This percentage is lower when compared to our study where 76.9% interns and 92.8% PGs knew how to perform CPR. Whereas, the competency to administer IM (43.8%) and SC (49.4%) injections was reported to be higher among the participants of Shenoy et al. [8] study as compared to our study. In a study by Jodalli et al.[12], 30.5% participants feel competent to administer IV injections and 41.9% feel competent to administer IM injections.

During medical emergencies, BLS is a key component which improves the chances of survival as it prevents CNS from undergoing irreversible damage due to hypoxia or anoxia. Thus, providing BLS to patients is certainly an important step before definitive treatment is planned. [8,16,17] Present study showed that only one-fourth of participants have practical training to handle medical emergencies. In study by Jodalli et al. [12], it was found that only 57.1% participants have received BLS training. Therefore, it is evident that there is an alarming need for a separate and thoroughly planned BLS and ALS programme for dental professionals. And it's emboldening to know that most of participants are willing to undergo proper and thorough training for the same.

The result of our study revealed that even though medical emergencies are quite common in dental set-up, the dental students have low competence in handling them. The participants have theoretical knowledge about the medical emergencies but they are not confident enough to deal with them. They lack adequate training, which could be attributed to a deficient dental curriculum. The curriculum should be meticulously designed to lay emphasis on both quality and volume of medical emergency training which dental students receive. Arrangement should be made to keep them updated with the revisions and additions in the medical emergency guidelines via continuing dental professional programmes.

Table 1: Demographic characteristics of the participants

Year of Study	Male (%)	Female (%)	Mean age (in Years) (Standard deviation)
Internship	33.3	66.7	24.05 (0.896)
Post-graduation	37.7	62.3	25.54 (1.023)

Table 2: Knowledge about medical emergencies among dental students

S.no	Question		Interns	PGs	p-value
1.	Do you know how to diagnose medical emergencies?	Yes	91%	88.4%	0.786
		No	9%	11.6%	
2.	Do you have the knowledge about the commonly used emergency drugs and their routes of administration?	Yes	62.8%	89.9%	<0.001
		No	37.2%	10.1%	
3.	Are you aware of the common drugs and materials in dentistry that can precipitate allergic reaction?	Yes	64.1%	81.2%	0.027
		No	35.9%	18.8%	
4.	Are you aware of the stress reduction protocol?	Yes	71.8%	88.4%	0.014
		No	28.2%	11.6%	
5.	Have you ever encountered any medical emergency in clinics?	Yes	71.8%	75.4%	0.709
		No	28.2%	24.6%	
	a) If yes, did you ask for assistance?	Yes	78.8%	66.7%	0.127
		No	21.2%	33.3%	
6.	Type of training you received for handling medical emergencies: a) Theoretical		75.6%	72.5%	0.708
	b) Practical		24.4%	27.5%	
	c) None		-	-	
7.	Do feel you have inadequate training to handle Medical emergencies?	Yes	73.1%	79.7%	0.438
		No	26.9%	20.3%	
8.	The inadequacy is attributed to:	a)Lack of time	70.5%	76.8%	0.456
		b)Don't know where to go	29.5%	23.2%	
		c)Don't feel its neces sary	-	-	
9.	Are you willing to undergo proper training to handle medical emergencies?	Yes	85.9%	89.9%	0.615
		No	14.1%	10.1%	

Chi-square test: to compare groups

p-value: <0.05 as statistically significant

Table 3: Attitude of dental students towards handling of medical emergencies

S.no	Questions	Year of study	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1.	Dentists should be well versed with the knowledge of handling medical emergencies	Interns	87.2%	12.8%	-	-	-
		PGs	92.8%	5.8%	-	-	1.4%
2.	A separate BLS and ALS programme must be there for dental students.	Interns	67.9%	21.3%	6.4%	-	2.6%
		PGs	75.4%	17.4%	-	-	7.2%
3.	Stress reduction protocol must be followed for patients with relevant medical history	Interns	80.8%	16.7%	2.6%	-	-
		PGs	92.8%	7.2%	-	-	-
4.	All emergency equipments and drugs must be installed in each and every clinical setup	Interns	76.9%	19.2%	3.8%	-	-
		PGs	89.9%	10.1%	-	-	-
5.	Vitals must be recorded during history taking	Interns	78.2%	20.5%	1.3%	-	-
		PGs	92.8%	7.2%	-	-	-
6.	Thorough medical history is important before any dental procedure.	Interns	79.5%	19.2%	1.3%	-	-
		PGs	88.4%	11.6%	-	-	-

Chi-square test: to compare groups

p-value: <0.05 as statistically significant

Table 4: Self-perceived competence about few basic procedures that aid in handling medical Emergencies

S.NO	Do you know how to-		Interns	PGs	p-value
1.	How to perform basic life support	Yes	75.6%	92.8%	0.007
		No	24.4%	7.2%	
2.	Perform cardiopulmonary resuscitation	Yes	76.9%	92.8%	0.011
		No	23.1%	7.2%	
3.	Give artificial respiration	Yes	70.5%	91.3%	0.002
		No	29.5%	8.7%	
4.	Give an intramuscular injection	Yes	20.5%	36.2%	0.043
		No	79.5%	63.8%	
5.	Give an intravenous injection	Yes	20.5%	40.6%	0.011
		No	79.5%	59.4%	
6..	Give an subcutaneous injection	Yes	23.1%	32.4%	0.265
		No	76.9%	67.6%	
7.	Perform Heimlich manoeuvre	Yes	56.4%	68.1%	0.174
		No	43.6%	31.9%	
8.	Check the carotid pulse	Yes	59%	76.8%	0.023
		No	41%	23.2%	

Chi-square test: to compare groups

p-value: <0.05 as statistically significant

CONCLUSION

Dental students should be confident and prepared to deal with medical emergencies arising during their practice. However, the data from our study and other recent studies showed lack of competence and confidence among them to deal with medical emergencies. This is pointing towards an alarming situation that should be dealt by dental councils around the globe. Reforms in the dental curriculum and thorough training of dental students at an initial stage will help to increase their confidence and competence to deal with medical emergencies. Thus, reducing threat and increasing the survival rate of patients, as well.

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Relationship between Nutritional Status, Anemia, Birth Labor, and Delayed of Referrence to Maternal Mortality in Katingan 2013-2015

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ABSTRACT

Event of mortality is basically the end of the accumulation process (outcome) of the various causes of mortality directly or indirectly. In Katingan, maternal mortality rate is above the national average since 2013, 2014, and 2015 respectively following cases 322.71, 556.52 cases, and 417.83 cases per 100,000 live births. Meanwhile, national targets are at 228 per 100,000 live births. McCarthy and Maine proposed three factors that influence maternal mortality is close determinants, determinants and determinants far between. Nutritional status, anemia, birth attendants, and the delay between the referral is a determinant of maternal mortality. The design / research design used in the study is analytic observational case control, which is a risk factor research study with retrospective approach. This study was conducted in Katingan for 7 months ie from February to August 2016. The control population consisted of all mothers postpartum in Katingan who did not experience maternal mortality during the years 2013 to 2015. The sample in this study as many as 32 cases. The results showed that the nutritional status, anemia status, and birth attendants have no significant relationship with maternal mortality, with a p-value respectively as follows 0,113, 0,113 and 0,024. However, delayed in reference has a significant association with maternal mortality with p-value = 0.0001.

Keywords: *nutritional status, anemia, birth attendants, maternal mortality*

INTRODUCTION

Event of mortality is basically the end of the accumulation process (outcome) of the various causes of mortality directly or indirectly. The incidence of mortality in the region from time to time to provide an overview development of public health and are used as indicators in assessing the success of development programs and health services. One of the indicators in development programs and health services is the maternal mortality rate (MMR)[1].

Maternal mortality is the mortality of every woman during pregnancy, childbirth or within 42 days after the end of pregnancy from any cause, regardless of age and location of the pregnancy, by any cause related to or aggravated by pregnancy or its handling but not by accident or incidental (factor accidental). This is consistent with the definition of the International Statistical Classification of Diseases and Related Health Problems (ICD). Maternal Mortality Rate (MMR) is then defined as the number of maternal mortality over a period of time in 100,000 live births[2].

Based on data from the World Health Organization (WHO) in 2015 estimated there will be 303,000 maternal mortality in 2015, the maternal mortality as a result of complications arising from pregnancy and childbirth, it is estimated that there is a maternal mortality rate of 300 per 100,000 live births (estimated maternal mortality) [3]. This means that one woman in the world will die every minute. 58% of maternal mortality occur in developing countries such as Indonesia, and in fact most of these mortality are preventable. The maternal mortality rate (MMR) in Indonesia in 2012 was 359 per 100,000 live births so that it is almost certain that Indonesia would not be able to achieve the Millennium Development

Goals (MDG's), reducing the MMR to 102 per 100,000 live births in 2015[4].

AKI is high in a region basically describes a low degree of public health and potentially cause economic and social deterioration in the level of the household, community and national levels. However, the biggest impact of maternal mortality in the form of decreased quality of life of infants and children caused shock in the family and later influenced the development of the child. Based on data from Central Kalimantan profile of maternal mortality in 2014 showed a significant increase from the year 2013 increased by 75 cases to 101 cases in 2014. In Katingan, maternal mortality rate is above the national average since 2013, 2014, and 2015 respectively following cases 322.71, 556.52 cases, and 417.83 cases per 100,000 live births. Meanwhile, national targets are at 228 per 100,000 live births[5].

McCarthy and Maine proposed three factors that influence maternal mortality is close determinants, determinants and determinants far between. The process that is closest to the incidence of maternal mortality, referred to as a determinant close to that pregnancy itself and complications in pregnancy, childbirth and the postpartum period (obstetric complications). Close determinant is directly influenced by the determinants of that status of maternal health, reproductive status, access to health care, behavioral health care / health services utilization and other factors that are unknown or unexpected. In addition, there is also a determinant much that will affect the incidence of maternal mortality through its influence on the determinant between, which includes socio-cultural and economic factors, such as the status of women in the family and society, the status of the family in society and the status of the community[6].

According to the results of research conducted by Fibriana of 2007 states that birth attendants do not have a relationship with the mother's mortality. While the delay in referral, anemia status, and nutritional status have a relationship with the maternal mortality (Fibriana AI, 2007). In connection with this, then do research to explain the relationship between nutritional status, anemia, Helper Maternity and Referral Delay with Maternal Mortality in Katingan in 2013-2015 as in 2010-2012 no data was incomplete so the research is taken just the year 2013-2015.

METHOD

Research design used in this study is analytic observational with case control, a study that studied the risk factors with retrospective approach, meaning that research began by identifying the groups affected by the disease or certain securities (cases) and a group without effect (control), then identify the risk factors in the past, so as to explain why the cases affected, while the controls are not affected[7].This study was conducted in Katingan for 7 months from February to August, 2016. This study population consisted of case and control populations. The population consisted of all cases of families who experienced the mortality of a mother in Katingan years 2013-2015 were recorded in maternal mortality data in Katingan District Health Office. Sample groups of cases in this study is the family / mother / midwife / person who knows the journey of maternal mortality. Overall number of samples is 64 samples. The instrument used in this study is documentation of verbal autopsy, KMS pregnant women, register cohort of pregnant women as well as data collected using a questionnaire tools.

RESULTS AND DISCUSSION

A. Univariate Analysis

Table 1. The frequency distribution of nutritional status, anemia, birth attendance, and delayed of reference to maternal mortality

Variable	Category	Cases		Control	
		n	%	n	%
Nutritional Status	Good	28	87,5	32	100
	Not good	4	12,5	0	0
Anemia	Not good	28	87,5	32	100
	Anemia	4	12,5	0	0
Birth attendants	Health worker	26	81,3	32	100
	TBAs	6	18,7	0	0
Delayed in Reference	Not delayed	6	18,8	32	100
	Delayed	26	81,2	0	0

Above table shows that the frequency distribution of nutritional status in the case group who experienced nutritional status is not good 4 (12.5%) of respondents. Previous research found that cultural factors and traditions still play a role in the process of postnatal care through family influences that play a role in the treatment of post-partum. Most of these practices is the prohibition or compulsion to take certain foods. At the time of parturition, the mother only eat white rice without animal protein and limit the consumption of water because they can slow down the process of wound healing. It can reduce postpartum maternal conditions that require sufficient nutrition to restore the body and helps breastfeeding[8,9].

Mothers who are anemic in the case group 4 (12.5%) of respondents. According to data released by UNPF (United Nations Population Fund), WHO (World Health Organization), UNICEF (United Nations Children's Fund) and the World Bank show that one woman dies every minute due to pregnancy problems. Previous research has found that anemia due to iron deficiency is a major cause of anemia in pregnant women compared with a deficiency of other nutrients. According to the WHO, approximately 80% of maternal mortality is a direct result of direct complications during pregnancy, childbirth and post-partum period and 20% of maternal mortality occur due to indirect causes.

Mothers who use birth helper is TBAs in case group 6 (18.7%) of respondents. Almost all of Indonesia is still a lot of births attended by TBAs. Both in rural and urban areas, including the type of informal leaders shamans because they typically have the power and authority that is respected by the people around him. Its authority, especially the authority. Theoretically, the authority can be distinguished on traditional authority, the authority of rational and charismatic authority[10]. Shamans are considered as a person who has authority charismatic (Adhimiharja, 2005), a special ability or authority that there is in him. Authority was held without studied, but exists by itself and is a gift from God[10].

Moreover, from several studies of TBAs had done turned out the role of TBAs are not just limited to the aid delivery, but also includes a variety of other ways, such as wash clothes after the mother gave birth, baby bathing during the umbilical cord has not been crowbar (off), massaging the mother after gave birth to her, bathe her mother, washing the hair of women after 40 days of delivery, do alms ceremony to nature supra-natural, and can give peace to the patient for any actions connected with nature supra-natural according to people's beliefs will affect human lives[10,]

Mothers who delayed referral in case group were 26 (81.2%) of respondents. Families dominate in the decision to refer the mother to the health service. This shows that mothers or women lack the power in the decision-Observers in the family although associated with problems concerning the safety of his soul. Efforts decision to refer the mother to a hospital is often influenced by the culture developed in the community to negotiate. In addition, cost constraints are also a reason for the delay in decision-making. This constraint is often the cause delays in reference to mothers from poor families so that families do not dare bring mom to the hospital. Families often assume if treated at the hospital will cost a lot, especially as in the case of pregnancy or childbirth complications. Delay in making the decision to refer the mother to a referral hospital also occur due to ignorance of the danger signs should immediately get treatment[11].

B. Analysis Bivariat

Table 2. Factors Associated with Maternal Mortality

Variable	p-value	**Description**
Nutritional Status	0,113	Unrelated
Anemia	0,113	Unrelated
Birth attendants	0,024	Unrelated
Delayed in reference	0,0001	Related

The table above shows that nutritional status has no significant relationship between maternal mortality (p-value = 0.113). This is in line with research Aeni N (2013) which states that the nutritional status had no connection with the mortality of the mother[12]. In this study also showed that anemia has no significant relationship between maternal mortality (p-value = 0.113). This is in line with research Aeni N (2013) which states that anemia not related to maternal mortality. Anemia can be identified and prevented by measuring hemoglobin levels when maternal antenatal. So if the routine antenatal mother, then the mother's risk of experiencing complications will be reduced[13].

In this study also showed that birth attendants have no significant relationship with the maternal mortality (p-value = 0.024). In a study conducted by Fibriana AI

(2007) also found that birth attendants have no significant relationship with the mother's mortality. Personnel trained birth attendant is one of the most important techniques in reducing maternal mortality in countries that have successfully lowered maternal mortality rates in the country. Although evidence has shown that the handling of labor by doctors, midwives and nurses is an important factor in reducing the maternal mortality rate, only 58% of all births attended by trained personnel. In those developing countries, only 53% of women give birth with the help of health professionals (midwives or doctors) and only 40% who give birth in hospitals or health centers, and an estimated 15% of pregnant women will experience life-threatening complications, which require service immediately. There are many factors that underlie these circumstances, among others, is the lack of trained personnel and lack distribution the personnel in these[14,15]. This study is also consistent with research Aeni N (2013) which states that birth attendants do not have a relationship with the mother's mortality.

Delay references have meaningful relationships with maternal mortality (p-value = 0.0001). The results of the study according to research conducted by Ika Arulita Fibriana and Mahalul Azam (2010) showed that the variables related to maternal mortality in Cilacap ie first delay ($p < 0.001$). The cause of the highest maternal mortality due to bleeding caused by delays in treatment and referral. In addition, the delay factor of decision making in the family are also factors that prove fatal to the mother in labor. Apart from the delay in the decision-making factors, geographic factors and economic constraints, delays in seeking help also caused by the existence of a conviction and resignation of the public that everything that happens is an inevitable destiny. Even in the choice of the place of delivery is correct, not uncommon occurrence of maternal mortality also occur in health facilities. This is because the delay in referring women giving birth mothers to health facilities. In addition to delays referral maternal family would think of a number and / costs to be incurred by the maternal family, of course, everyone knows that the tariffs of service and care in health facilities are not cheap[16].

CONCLUSION

The results showed that the nutritional status, anemia status, and birth attendants have no significant relationship with maternal mortality, with a p-value respectively as follows 0,113, 0,113 and 0,024. However, delays in referrals has a significant association with maternal mortality with p-value = 0.0001. The advice can be given based on this research is Katingan need to be done early detection of risk factors and potential, especially obstetric complications of pregnancy and childbirth in order to do prevention optimally. Necessary to improve the quality of antenatal and post-natal care including by improving the quality of health workers with technical skills training and non-technical midwifery who served in the village. Furthermore, the support of family, especially her husband, parents or other family members who live with pregnant women in overseeing risk factors through the provision of information and knowledge about the risks of pregnancy danger signs so that when there are complications could be identified and receive immediate treatment.

Ethical Clearance: This study approved and received ethical clearance from the Committee of Public Health Research Ethics of Medical Faculty, LambungMangkurat University, Indonesia. In this study we followed the guidelines from the Committee of Public Health Committee of Public Health Research Ethics of Medical Faculty, LambungMangkurat University, Indonesia for ethical clearance and informed consent. The informed consent included the research tittle, purpose, participants's right, confidentiality and signature.

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Expression of Gen Monocyte Chemoatractant Protein 1 (MCP-1) mRNA on Preeclampsia

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ABSTRACT

Background and Objective: This study aims to determine the expression of mRNA MCP-1 gene in Preeclampsia Patients.

Materials and Method: The research method used is quantitative research using case-control design with the sample of 20 respondents consisting 10 cases and 10 controls. Case samples were pregnant women with preeclampsia at the time of the study while control samples were normal pregnant women who met inclusion and exclusion criteria. Data were analyzed using Independent T-Test statistics.

Results : The results showed that 95% CI with LL = -6,465 and UL = - 4,852, with p = 0,000 mean that average expression of mRNA MCP-1 gene in blood expressed was higher in preeclampsia group. While 95% CI value with LL = -6,371 and UL = - 4,688, with p value = 0.000 mean that average expression of mRNA MCP-1 gene on exposed placenta is also higher in preeclampsia group.

Conclusion : It is necessary to follow up with prospective cohort design by making the class of pregnant mothers at risk with guidance for preeclampsia and determine of profile mRNA expression MCP-1 gene in both blood and placenta as molecular pathophysiology.

***Keywords**: Preeclampsia, MCP-1, mRNA*

INTRODUCTION

Preeclampsia is one of the complications of pregnancy which is the leading cause of death 15 - 20%, in developing countries along with bleeding and infection. In Indonesia, MMR is still high, the analysis result of Indonesia's demographic and health surveys (SDKI) in 1997 shows that maternal mortality rate is 334 deaths per 100,000 births. This number decreased to 307 per 100,000 births in 2003 to 228 deaths in 2007. The target of maternal mortality for 2010 was 125 deaths per 100,000 births.[5]

The maternal mortality rate in South Sulawesi province in 24 districts was obtained in 2012 are 140 people, in 2013 are 108, in 2014 are 138, and in 2015 are 149 people. From the 24 districts of South Sulawesi Province, Gowa regency has a high prevalence of maternal mortality. This is caused by many factors including lung disease, pregnant women's nutritional problems, hypertension, malaria, STI, abortion, heart disease, diabetes, HIV-AIDS, goiter, asthma, bleeding, Infections and Delinquent Childbirth. Based on the data obtained that the distribution of maternal mortality based

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on where the death of most mothers in the RSU that are 115 people.[3]

One of the factors causing preeclampsia is the role of increased concentrations of proinflammatory cytokines and the effect on preeclampsia, this cytokine is TNF-α. TNF-α levels will increase and this results in systemic inflammation. This inflammatory process is possible to have a connection with the incidence of preeclampsia. Increased TNF- α will cause increased expression of MCP-1 in endothelial cells and this results in a change in the balance between vasodilator and vasoconstrictor materials resulting in general vasospasm and decreased perfusion of some organs. Decreased perfusion of some organs due to imbalance between vasodilator material and vasoconstrictor material resulted in the emergence of preeclampsia in pregnant women.[9]

The increase of MCP-1 chemokine in maternal circulation plays a central role in increasing the systemic inflammatory response characterized by extensive endothelial dysfunction which is the characteristic of maternal syndrome in preeclampsia.[8]

TNF-α and IL-1β increase the production of MCP-1 in the decidua in the first trimester. This demonstrates the mechanism by which excess macrophages in the decidua can damage endovascular trophoblastic invasion, placental defects primarily in preeclampsia.[2]. This study aims to determine the expression of mRNA MCP-1 gene in Preeclampsia and normotensive.

MATERIALS AND METHOD

The study population was all normal pregnant women and preeclampsia at BLUD RSUD H. Padjonga Daeng Ngalle Takalar from October 2016 until June 2017 with No.47/445/RSUD-HPDN/PM/IX/2017. The sample in this research is pregnant women who meet inclusion criteria of primigravida and multigravida mother with third trimester pregnancy age. The subjects of the study were purposive sampling consisting of 20 samples of patients with two groups of 10 samples of normal pregnant women and 10 samples of preeclampsia pregnant women. In this study, interviews were conducted to obtain information about the characteristics and general circumstances of the subjects such as name, age, number of children, history of previous illness and health service history (ANC) by looking at KIA book / midwife notebook, then diagnosed by using blood pressure criteria ≥ 140 / 90mmHg as case and blood pressure less than 140 / 90mmHg as control. Urine samples were then taken for proteinuria and edema testing. Furthermore, samples of blood respondents were taken for examination of mRNA expression MCP-1 gene. The blood specimens of the study subjects were taken when the mother visited the ANC Room of the Hospital of H. Padjonga Daeng Ngalle Takalar Takalar then traced until the mother gave birth and taken the placenta tissue then examined. In Immunology and Molecular Biology Laboratory of Hasanuddin University of Makassar University Indonesia using molecular technique i.e. Real-Time Polymerase Chain Reaction (RT-PCR). Data analysis was performed using Independent T-Test using SPSS version 22 statistic program.

RESULTS

After calculation all data from research then data was elaborated in term of table as follow, table1.

Table 1. Respondents Characteristics

Variables	Normotensive		Preeclampsia	
	n	%	n	%
Age				
<20 and > 35	2	20	5	50
20-35	8	80	5	50
Parities				
1-3	10	100	7	70
>3	0	0	3	30

Table 1 shows that the age of respondents in the normotensive group is <20 and> 35 years of age as many as 2 respondents, while the age of 20-35 years is 8 respondents. While the age of respondents in the preeclampsia group is <20 and> 35 years old as many as 5 respondents, while the age of 20-35 years as many as 5 respondents. While based on parity shows that the highest percentage is respondents with 1-3 persons in the group preeclampsia group that is as much as 70% while respondents with parity> 3 people in the case group as much as 30%. While in the group of normotensive parity of 1-3 people is as much as 10 or 100%.

Table 2. Expression of mRNA Gene MCP-1 in Blood

Expression of mRNA gene MCP-1 in blood	n	Mean	SD	95%CI	P
Normotensive	10	5,738	0,617	(-6,465)-(-4,852)	0,000
Preeclampsia	10	11,398	1,045		

Table 2. showed that the mean of mRNA expression MCP-1 blood in the normotensive group was 5.738 Ct with a standard deviation of 0.617 Ct while in preeclampsia 11.398 Ct with a standard deviation of 1.045 Ct. Based on statistical analysis, 95% CI with LL = -6,465 and UL = - 4,852 with p = 0,000 mean that the average expression of mRNA expression MCP-1 in blood was higher in preeclampsia group.

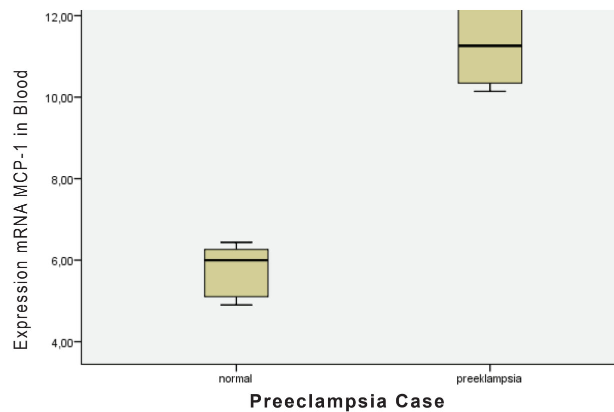

Figure 1. The MCP-1 mRNA Expression in Blood

Table 3. Expression of mRNA Gene MCP-1 in Placenta

Expression of mRNA gen MCP-1 Placenta	n	Mean	SD	95% CI	P
Normotensive	10	6,565	0,655	(-6,371)-(-4,688)	0,000
Preeclampsia	10	12,094	1,083		

Indicates that, the mean mRNA expression of placental MCP-1 in the normotensive group was 6,565 Ct with a standard deviation of 0.655 Ct while in preeclampsia was 12.094 Ct with a standard deviation of 1.083 Ct. Based on statistical analysis, 95% CI with LL = -6,371 and UL = - 4,688, with p = 0,000 mean that average of mRNA expression of MCP-1 in placenta expressed higher in preeclampsia group.

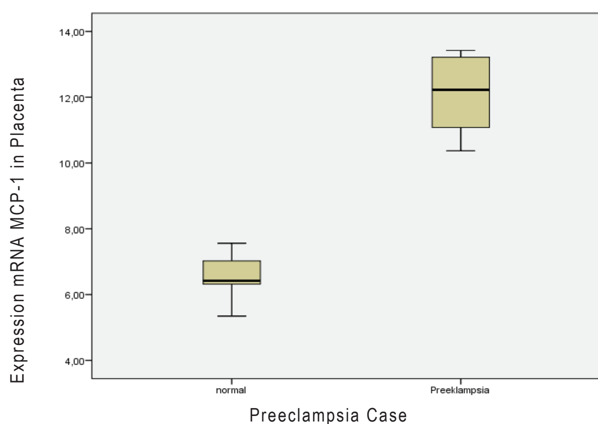

Figure 2. The MCP-1 mRNA Expression in Placenta

DISCUSSION

Age is an essential part of reproduction status. The Age has relation to the increase or decrease of body's function by which it influences the status of someone's health. The best and the most secure age for pregnancy and bearing is between 20-35 of age whereas the woman's first pregnancy of young age as well as the pregnant woman at the age of >35 would be in very high risk in preeclampsia.

The Pregnant woman without hypertension who is in the hazard of preeclampsia is the one at the age of >35. The age group of that has a vital correlation with preeclampsia, so does the age variable to high blood pressure.

The result of research reveals that the respondents who have had preeclampsia at risking parity >3 are 3 (30%) of 10 respondents. Furthermore, those at not risking parity (1-3 times) are 7 respondents (70%). The respondents without dominant preeclampsia at not risking parity (1-3 times) are 10 respondents (100%).

The first parity is related to the lack of experience and knowledge of the mother in the care of pregnancy. The parity 2-3 is the safest one. The Parity one and high parity (more than 3) are the hazardous parity at most. The Mother with great parity (more than 4) has been in a reduction at the system function of reproduction. The other reason, the mother at certain time is so stuck in keeping house that the one would be exhausted and is less- attention of nutrient adequacy.[11]

According to[8] preeclampsia / eclampsia constitute 80% of all cases of hypertension in pregnancy and affects between 3-8% of patients, primarily primigravida/ primipara in second trimester pregnancy. This is consistent with Rozhikan's[6] study, suggesting that the parity factor (the first child) is at risk for severe preeclampsia 4,751 times compared with the second or third pregnant women (multigravida). This is in line with theory[7], which says that in primigravida the frequency of preeclampsia is higher when compared with multigravida.

All women have a risk of preeclampsia during pregnancy, maternity, and childbirth. Preeclampsia does not only occur in primigravida / primipara, in Grande multipara also has the risk to experience eclampsia. For example, it occurs in pregnant women and maternity more than three times. Excessive stretching of the uterus causes excessive ischemia which can lead to preeclampsia.[6]

The results of the study based on bivariate test of mRNA expression MCP-1 showed significant results in preeclampsia. Statistical results showed that expression of placental MCP-1 mRNA expressed higher than blood in the preeclampsia and normotensive groups. This is in line with the results of a study conducted by[2] which describes a statistically significant increase in macrophages (CD68-positive cells) in decidua in patients with preeclampsia. To explain the regulation of monocyte infiltration, the expression of monocyte chemo-attractant protein-1 (MCP-1) can be assessed in the first trimester of the leucocyte decidua cell independently. Comparison of response concentrations revealed that 0.01 ng / ml TNF-α or IL-1β increased the production of MCP-1 by more than 15-fold. This study shows that TNF-α and IL-1β increase the production of MCP-1 in the decidua in the first trimester. This study demonstrates the mechanism by which macrophages excess in the decidua can damage endovascular trophoblastic invasion, placental impairment primarily in preeclampsia.[2]

The interstitial cytotrophoblast enters the decidua floor, then circles and penetrates the spiral arteries and arterioles, and becomes the endovascular cytotrophoblast that alters the smooth muscle layers and endothelial vessels. This process changes the small blood vessels, high vascular resistance to large diameter blood vessels, low blood vessel resistance to meet the demands of fetal placenta unit growth by increasing maternal blood flow. The invasion of endovascular trophoblastic is the occurrence of failure of major placental defects in

preeclampsia and fetal intrauterine growth. This leads to inadequate conversion of the uterine artery and reduces the amount of blood in uteroplacental development. This can affect 3 to 10% of all pregnancies; preeclampsia is a major cause of maternal and fetal mortality and morbidity worldwide.[1]

CONCLUSION

mRNA expression MCP-1 gene in blood and Placenta was expressed higher in the preeclampsia group than in the normotensi group at the BLUD Hospital H. Padjonga Daeng Ngalle Takalar.

Conflict of Interest: No conflict of interest was declared.

Ethical Clearance- Approved by Medical Faculty committee, Hasanuddin University, Makassar.

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Does South Africa need a HIV-AIDS Regulatory Framework as a Public Management Tool for HIV-AIDS Programmes?

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ABSTRACT

South Africa bears the brunt of HIV-AIDS with the highest incidence and disease prevalence in the world. UNAIDS estimates that, of the 36.7 million individuals infected with HIV-AIDS globally, 19.1 million reside in South Africa7. In addition, approximately 2.1 million new HIV infections occurred in 2015 with almost 960 000 of those occurring in South Africa signalling that the rates of infections are not dropping as expected6.Given the unrelenting nature of this disease burden, even greater efforts are now required to turn the tide on HIV-AIDS globally, but more so in South Africa. These efforts entail more effective HIV-AIDS service delivery with combination prevention modalities, access to HIV-AIDS treatment and care, harm reduction of HIV-AIDS stigma and discrimination together with HIV-AIDS education, awareness and advocacy. This has led to the development of many global and local Non-Governmental Organisations, Non Profit Organisations, Private and public organisations that have embarked upon the development of HIV-AIDS management and treatment programmes. However, these programmes currently exist in an unregulated environment but have the potential to run as cost effective, efficacious and successful programme aimed at attaining the optimal health for their patients should a standard exist. No current global or local standard or regulation exists to date governing HIV-AIDS Management Programmes in South Arica. The aim of this paper is to review the HIV-AIDS landscape to assess if any regulatory frameworks exist and to propose the development of a standard for HIV-AIDS management programmes with guidance for use in the multisector response to curb HIV-AIDS globally and locally.

Keywords: *HIV-AIDS, regulatory, frameworks.*

BACKGROUND

HIV-AIDS continues to be a major global public health issue7. In 2016, an estimated 36.7 million people were living with HIV (including 1.8 million children) – with a global HIV prevalence of 0.8% among adults. Around 30% of these same people do not know that they have the virus6. South Africa has the biggest and most high profile HIV-AIDS epidemic in the world, with an estimated 7.1 million people living with HIV-AIDS in 20161. Despite challenges, new global efforts have meant that the number of people receiving HIV-AIDS treatment, prevention and care has increased dramatically in recent years, particularly in resource-poor countries South Africa has the largest antiretroviral treatment (ART) programme globally and these efforts have been largely financed from its own domestic resources. The country now invests more than $1.5 billion annually to run its HIV-AIDS programmes1. Global access to antiretroviral treatment in many places remains unacceptably low. With the latest WHO guidelines recommending treatment for all people living with HIV-AIDS, programmes and funding need to be scaled up as result of test and treat, this places a further burden to the already strained HIV-AIDS management programmes to ensure that the objectives are reached to ensure strategic, operational and socio-economic goal alignment. The HIV-AIDS treatment cascade is a model that outlines the steps of care that people living with HIV go through from initial diagnosis to achieving viral suppression and shows the proportion of individuals living with HIV who are engaged at each stage4. This is an important tool to classify the amount of individuals requiring care, support and treatment which allows

governments and healthcare organisations to effectively plan and mage resource allocation, budgetary with fiscal management and treatment and drug allocation with utilization. HIV-AIDS health care guidelines and quality standards are mandatory to improve the quality of health and care services but unfortunately a formal regulatory framework or standard remains at large for management of HIV-AIDS programmes. This paper seeks to review the HIV-AIDS landscape to assess if any regulatory frameworks exist and to propose the development of a standard for HIV-AIDS management programmes with guidance for use in the multisector response to curb HIV-AIDS globally and locally.

LITERATURE REVIEW

Several South Africans are infected with HIV-AIDS. Access to progressive treatment, and care and the right to privacy are all serious issues that have elicited strong debate in the past. The statutes that expressly deal with matters pertaining to HIV are the Bill of Rights in South Africa's Constitution and the Promotion of Equality and Prevention of Unfair Discrimination Act No. 4 of 2000. There are also codes of good practice outlined in terms of the provisions of Labour Relations Act No. 66 of 1995 and the Employment Equity Act No. 55 of 19983. However, there are no quality management regulatory frameworks for healthcare and in particular for HIV-AIDS.

Quality management ensures that an organization, product or service is consistent and is delivered with superior levels of quality. In recent years, quality management has become significant in the global and South African healthcare sector as a means to improve the effectiveness of treatment and increase patient satisfaction within health service delivery. Quality management in healthcare focuses on the oversight of programmes that improve patient care and safety, resource utilization and ancillary services2.

Healthcare organisations are increasingly becoming committed to the provision of quality healthcare for all. Quality and commitment to quality is a core value and key business strategy for most private healthcare facilities5.Most South African private healthcare facilities have committed to clinical excellence, quality service, respect and empathy for their patients in order to ensure that patients receive world class clinical care, as well as to ensure that the patient experience addresses the needs of patients and their families5.In South Africa, although this proactive change is seen more in the private healthcare sector, similar efforts are being made in the public healthcare sector in South Africa. With the planned 14-year roll-out of the National Health Insurance in South Africa, the National Health Insurance White Paper delineates stronger focus on patients and patients' health in both private and public healthcare sectors.

In the South African private health sector, quality health and safety is an integral part of an organisations' service delivery. Private sector employees play an integral role in creating and developing the quality culture in private hospitals and contribute to the sustainability of the quality management system. Enhancing the customer experience and the working environment for all private sector health employees supports the purpose of making life better in these health environments5.Quality management deals with delivering consistent quality which, in turn, requires reliable processes. Reliability requires strong leadership commitment with the existence of performance goals, risk reduction procedures, quality improvement policies, quality measurement systems and reward mechanisms5.

HIV-AIDS has gained the attention of several private, public and parastatal helthcare organisations which are all involved in the fight against HIV-AIDS. Given the overwhelming burden of disease, together with patient loads, access to treatment and care, it has become very necessary that clinical management programmes have clinical governance and regulatory frameworks to ensure optimal health and wellness outcomes.

METHODOLOGY

A retrospective review was undertaken of the South African HIV-AIDS local and global regulatory frameworks to assess current frameworks in place for management of HIV-AIDS programmes. There is a global and local void in this field to date, as such a local standard or regulation is proposed to govern HIV-AIDS Management Programmes in South Arica. The objectives of the regulatory framework will be to develop guidelines for HIV-AIDS management programmes ; To develop guidance on smart pharmacy practises within HIV-AIDS management programmes; To develop guidance on smart clinical guidelines governing patient treatment, wellness and care within HIV-AIDS management programmes;

To develop guidance on smart drug utilization review processes within HIV-AIDS programmes and To develop guidance on smart laboratory practises within HIV-AIDS management programmes.

Other objectives are to develop guidance on smart infrastructure and office management within HIV-AIDS management programmes; To develop guidance on smart quality assurance and quality control practises within HIV-AIDS management programmes; To develop guidance on smart monitoring and evaluation practises within HIV-AIDS management programmes; To develop guidance on smart fiscal and governance practises within HIV-AIDS management programmes and to develop guidelines on HIV-AIDS advocacy, education and awareness within HIV-AIDS management programmes.

Benefits of development of a standard for HIV-AIDS management programmes:

A new benefit will streamlines processes within HIV-AIDS organisations and regulate the HIV-AIDS healthcare environment. This in turn will empower employees to learn and understand the requirements for HIV-AIDS management programmes which will allow for job creation within the local and global HIV-AIDS sector. This will allow communities where these HIV-AIDS programmes occur to become empowered to become aware about HIV-AIDS. An operational advantage is streamlining of processes and removal of inefficiencies which will result in a cost effective HIV-AIDS programme. Streamlining of processes and removal of inefficiencies will result in sustainable HIV-AIDS programme with self-running iniatives with less reliance on the government based assistance Ultimately regulating this healthcare sector governing HIV-AIDS will lead to better treatment and care with optimal patient benefit.

From a clinical risk point of view there will be less HIV-AIDS related mortality and morbidity. There will be more guidelines and guidance for prevention of costly and life threatening ARV treatment stock outs through development of forecasting tools which will enhance drug utilisation. There will be greater community mobilisation and upliftment with social mobilisation if HIV-AIDS programmes are run effectively hence allowing for productive individuals, households and communities.The development of a standard for HIV-AIDS management programmes with guidance for use will allow bigger better robust programmes to be undertaken with good systems governing all aspects of the programmes. There will be better capability to allow more patients access to treatment and care should a standard be developed .There will be increased reach in terms of how many more patients the HIV-AIDS programmes can offer service delivery to HIV-AIDS programmes will be able to deliver a consistent and standardised care model. The development of a standard for HIV-AIDS Management Programmes with guidance for use will allow organisations to breed sustainability to strive harder and reach higher goals. It will also promote better utilization of services based on patient choice.

CONCLUSION

A proposed standard will have several operational, socio-economic, regulatory and communal benefits. The development of a standard for HIV-AIDS management programmes with guidance for use will allow HIV-AIDS organisation to compete for tenders and businesses to build reputation and success. The development of a standard for HIV-AIDS management programmes with guidance for use will allow organisations to provide a standardised service delivery that is safe and reliable. It will afford communities the option of choice to choose their HIV-AIDS healthcare provider It will allow all patients to live healthier lives with optimal health outcomes. The development of a standard for HIV-AIDS Management programmes- will allow organisations to prevent drug stockouts resulting in continuous drug supplies for overall better treatment and care. This will in turn also lead to healthier communities as more effectively run HIV-AIDS programmes will lead to less spread of HIV-AIDS. This will in turn lead to fewer deaths secondary to HIV-AIDS resulting in less orphan headed families and less granny headed households. Children can attend schools and not have to stay home and look after their sick family members, therefore enhancing productivity in the community.

This will allow communities access to healthcare based on choice. It will give patrons and patients the ability to complain or compliment service delivery related to HIV-AIDS. Part of the proposed standard is to ensure HIV-AIDS advocy and education is imparted to all patients thus creating empowered patients who know their rights and can make informed decisions. This will enhance productivity of the South African population

with healthier nations and stronger nation building.

Ethical Clearance was gained from the Faculty Reasecrh Committee of the Durban University of Technology as part of the primary author's doctoral thesis.

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Conflict of Interest - Nil

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Analysis of the Cost Effectiveness of Improving Nutrition Intake and Nutritional Status in Patients of Reproductive Age Undergoing Haemodialysis Therapy in Makassar

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ABSTRACT

Introduction: The high cost of care and treatment for patients with kidney failure is a problem that requires effective cost planning, and patients undergoing haemodialysis often develop high levels of malnutrition due to gastrointestinal symptoms such as anorexia, nausea, vomiting and protein loss associated with the haemodialysis process. This study aimed to analyse the cost effectiveness of improving nutrition intake and nutritional status among patients of reproductive age undesrgoing haemodialysis therapy in Makassar. Materials and Method: In this cross-sectional study, data on independent and dependent variables were simultaneously collected at Hasanuddin University Hospital (RS.UNHAS) and Wahidin Sudirohusodo in Makassar. Qualitative and quantitative approaches were used to perform a descriptive comparative analysis. Results: In the HD group, the following results were obtained:1)most respondents (up to 70.0%) answered "Not" to all but one question only; 2)most respondents (up to 60.0%) answered "No" to these questions; 3)most respondents (up to 86.0%) answered "Not" to these questions; 4) most respondents (up to 94.0%) answered "Yes" to these question ; 5) most respondents (up to 86.0%) answered "Yes" to these questions; 6)most respondents (up to 98.0%) answered "Not" to these questions; 7)most respondents (up to 78.0%) answered "Yes" to these questions; 8)most respondents (up to 80.0%) answered "Yes" to these questions; 9) most respondents (up to 58.0%) answered "Yes" to these questions; and 10) most respondents (up to 92.0%) answered "Photo" to this question. Conclusion: Factors such as changes in lifestyle, diets high in fat and carbohydrates, and other causes, including genetic diseases, immune disorders and birth defects, may lead to the high number of renal failure patients.

Keywords: *Cost Effectiveness, Kidney Failure, Haemodialysis Therapy , Nutrition Intake*

INTRODUCTION

Chronic kidney disease (CKD) is a health problem worldwide that affects millions of people of all races and ethnic groups. CKD occurs when the ability of the kidney to excrete materials that the body does not need is irreversibly and chronically impaired 1-,5. Globally, the incidence and prevalence of CKD have increased sharply over the past decade6-8. Kidney disease can affect anyone who is seriously ill or injured in a manner that has a direct impact on the kidney. Kidney disease has been found to be more common in older adults9-11.

Protein energy malnutrition (PEM) occurs in many patients with chronic renal failure, kidney failure and terminal illness; it is usually identified in association with unexpected clinical events in these patients (e.g., hospitalization or death)12. The high mortality rates observed in patients with CKD are mainly due to complications of cardiovascular disease and, at an advanced stage of the disease, inflammation, infection and malnutrition. PEM is a complex syndrome that can be induced by both nutritional and non-nutritional factors. PEM is a state in which muscle mass, visceral fat and protein reserves are lost, and these losses are not entirely caused by inadequate nutrition intake12- 14 .

An analysis based on data from the United State Renal Data System (USRDS) showed a dramatic increase in renal disease patients requiring chronic dialysis or transplantation4. In 1999, 340,000 patients

required chronic dialysis or transplantation; however, this number was projected to increase to 651,000 patients in 201015,16.According to the third National Health and Examination Survey (NHANES III), the prevalence of CKD in adults in the United States was approximately 11% (19.2 million), with 3.3% (5.8 million) of patients having stage 1 CKD; 3% (5.3 million)of patients having stage 2 CKD; 4.3% (7.5 million) of patients having stage 3 CKD; 0.2% (340,000) of patients having stage 4 CKD; and 0.2% (340,000) of patients having stage 5 CKD (renal failure). At the international level, the average incidence of stage 5 CKD or kidney failure has increased from that observed in 198913,17.

Patients with chronic renal failure often require continuous renal replacement therapy. One type of renal replacement therapy is haemodialysis (HD). Adequate HD can improve survival, has minimal complications, and can improve quality of life, meaning that patients can live healthier and better lives. Poor quality of life has been reported in HD patients with poor physical health. The physical symptoms experienced by patients during HD or as a complication of HD include hypertension, intradialytic hypotension, left-sided heart failure, as cites, pleural effusion, congestive heart failure and death6,18,19. PEM requires more attention because it can be potentially reversed. Thus, the malnutrition in patients with CKD-HD could be treated by meeting their nutritional needs. Some researchers have found that patients with CKD-HD showed signs of malnutrition20,-23.

The infection and subsequent inflammation processes may lead to the release of catabolic products and cytokines that exacerbate malnutrition and accelerate the progression of atherosclerosis24. To prevent these declines and to maintain good nutritional status, health teams should monitor and evaluate health status and food intake. Essentially, the services provided by an integrated team consisting of doctors, nurses, dietitians and other health workers are needed to optimize the therapy that patients receive. Enhancing nutrition (Nutrition Care) aims to meet the nutritional requirements of patients by helping them achieve optimal nutritional status so that they can move normally, maintain fluid and electrolyte balances, and, in turn, have a fairly good quality of life25. Malnutrition may be an important predictor of mortality in HD patients, whose nutritional status should be evaluated via regular monitoring. A protein intake of 1-1.2 g/kg/day should be expected, with protein comprising 50% of the diet. The consumption of foods high in potassium, such as fruits and tubers, is not recommended. Total fluid intake should be limited because excess fluids may build up in the body. Sodium intake should be restricted to control blood pressure and oedema26-29.

Patients who undergo HD often suffer from malnutrition, inflammation and decreased quality of life, resulting in rates of morbidity and mortality that are higher than those observed in the normal population. An estimated 50% to 70% of dialysis patients have been reported to show signs and symptoms of malnutrition. Some factors that contribute to malnutrition in dialysis patients include uraemia, decreased protein and calorie intake, chronic inflammation, and comorbid acute or chronic diseases. These patients may experience weight loss and the loss of energy stores, including fat tissue and serum albumin protein, transferr in and other visceral proteins30,31. This research aimed to answer the following questions:

MATERIALS AND METHOD

This observational study had a comparative design and aimed to analyse independent and dependent variables32.To conduct this type of research, both descriptive and analytical analyses were employed because, in addition to assessing the influence of independent and dependent variables, we intended to describe the characteristics of the study sample. Because of limited time availability, a cross-sectional study was conducted to observe and measure the variables of interest at the same time or over the same period.33

Population and Sampling

In this study, the population included patients with renal failure who were undergoing HD in the location under study. A census technique, also known as saturation sampling, was used to select the study participants. This technique was used to generate generalizable results with very small error estimates, and the derived data were thus generalizable to all individuals in a given population. Another advantage was that estimates could be obtained with a high level of accuracy and precision. The sample was derived from a population of patients of reproductive age who were suffering from renal failure and undergoing HD. Reproductive age was established by biological age (the level of productivity of a person)33.

DATA ANALYSIS INSTRUMENT

The method used to collect data was determined based on the data source, and a data source was defined as anything that could provide information about data relevant to the research study. A combination of the following three previously used data collection techniques was applied: questionnaires, interviews and observations.

RESULTS AND DISCUSSION

Cost-effectiveness analyses can be used to compare the health outcomes associated with and costs of implementing a programme or intervention with those of other alternatives that may produce the same outcome. A cost analysis can be conducted to identify details regarding the costs incurred and resources used. HD care units provide a service to patients with renal failure, which is quite expensive because the price of medical supplies, drugs and consumables affect the cost of the service, as described in the following figure 1:

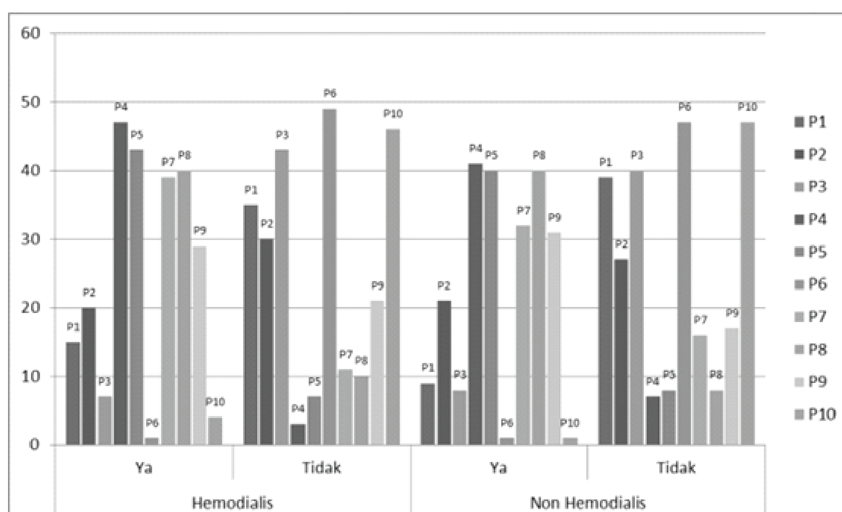

Figure 1: The haemodialysis and non-haemodialysis groups of patients with the results from ten questions

In the HD group, the following results were obtained:1)most respondents (up to 70.0%) answered "Not" to all but one question; 2)most respondents (up to 60.0%) answered "No" to this question; 3)most respondents (up to 86.0%) answered "Not" to this question; 4) most respondents (up to 94.0%) answered "Yes" to this question; 5) most respondents (up to 86.0%) answered "Yes" to these questions; 6)most respondents (up to 98.0%) answered "Not" to this question; 7)most respondents (up to 78.0%) answered "Yes" to these questions; 8)most respondents (up to 80.0%) answered "Yes" to these questions; 9)most respondents (up to 58.0%) answered "Yes" to these questions; and 10) most respondents (up to 92.0%) answered "Photo" to this question.

In the non-HD group, the following results were obtained: 1)most respondents (up to 81.3%) answered "Not" to all but one question; 2) most respondents (up to 36.3%) answered "No" to this question; 3) most respondents (up to 83.3%) answered "Not" to this question; 4) most respondents (up to 85.4%) answered "Yes" to this question; 5) most respondents (up to 83.3%) answered "Yes" to these questions; 6)most respondents (up to 97.9%) answered "Not" to this question; 7)most respondents (up to 66.7%) answered "Yes" to these questions; 8)most respondents (up to 83.3%) answered "Yes" to these questions; 9)most respondents (up to 64.6%) answered "Yes" to these questions; and 10) most respondents (up to 97.9%) answered "Photo" to this question.

Based on these results, renal failure patients should pay more attention to their food intake. Patients should not drink too much, eat too much salty food, or overeat because these practices can negatively affect the body and cause a variety of complaints8,11,12,15,18.In addition, the results of some studies have identified mortality rates as high as 40-70% in malnourished patients with chronic renal failure34,35.Although dialysis treatment may temporarily improve kidney function, this therapy should be continued only until the kidneys begin to function normally. In cases of chronic renal failure, the kidneys rarely return to normal functioning and, in most

patients, continuous dialysis is required36-41. In contrast to kidney stone disease, which can be cured in a variety of ways, kidney disease can be completely cured only via kidney transplantation8,18,20,26,30.Ideally, under these conditions, all forms of nutrients obtained from food will be maintained. The overall goals of nutritional management in CKD patients undergoing HD are to improve and maintain optimal nutritional status, prevent the accumulation of excess metabolic waste, regulate the balance of water and electrolytes, and prevent conditions associated with CKD, such as anaemia, hypertension, dyslipidaemia, bone disease, and cardiovascular disease.

CONCLUSION

The prevalence of kidney disease has increased in older adults, especially in elderly adults. However, over the course of time, kidney disease has also been identified in children. The high number of renal failure patients undergoing HD therapy may be influenced by many factors, such as changes in lifestyle, diets high in fat and carbohydrates, and other causes, including genetic diseases, immune disorders and birth defects.

Compared with kidney transplantation, HD is a less expensive means of treating patients with kidney failure, but this type of care has become very expensive because it must be performed continuously. One problem is that numerous patients require dialysis and the number of facilities is limited, which means that many patients must wait for dialysis. Despite the provision of funds by the government and society, these limitations are difficult to overcome. Therefore, the use of resources, especially financial resources, must be as effective and efficient as possible.

Ethical Clearance- Taken from Faculty of Medicine, Hasanuddin University

Conflicts of Interest: The authors declare that there is no conflict of interest within this research.

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Model of Hypertension Transmission Risks to Communities in Gorontalo Province

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ABSTRACT

Healthy behaviors are actions by individuals to maintain and improve their health, including disease prevention, personal hygiene care, maintenance of fitness through exercise and nutritious food. Healthy behaviors exhibited by individuals who feel that they are medically fit although they are not necessarily truly healthy. Disease prevention behaviors aimed at reducing and limiting all risk factors for the disease. Easily one of the diseases that occur due to behavioral factors are hypertension.

The observational analytic within case control design was used to study the variables with a convenience sample of 150 people with hypertension. The study showed that the self efficacy has a significant effect on self-regulation, with a path coefficient of 0,123 and T-Statistic value of 3,432. Collective efficacy also has a positive and significant impact to self-regulation, with a path coefficient of 0,312 and a value of 10,651 T-Statistic. On the other hand, self-regulation has a positive effect on behavior prevention, with a path coefficient of 0,765 and T-Statistic value of 44,132. Hypertension prevention behaviors have a positive and significant effect on hypertension, with a marked positive path coefficient of 0,889 with a T-Statistic value of 419,54.

Conclusions: Self-efficacy and collective efficacy directly affect self-regulation, and then influence the hypertension prevention behavior. It is therefore suggested to create health policy regarding health promotion to communities.

Keywords: *Risk of transmission, hypertension, Behavioral factor*

INTRODUCTION

Hypertension is well known diseases occurred due to behavioral factors. WHO report showed that 8-18% of the world population suffered from hypertension. According to Basic Health Research in Indonesia, 2011, the prevalence of hypertension on the population over the aged of 18 was 29.8% (based on measurements). While based on the diagnosis or the symptoms assessed by health providers, the prevalence of hypertension among Indonesia Population was around 30.3%. Meanwhile, the prevalence of hypertension in East Nusa Tenggara was 28.1% based measurement and according to a diagnosis of symptoms by health workers was about 38.0%, higher than the national prevalence[1-5.14].

Provincial Health Department reported regarding the ten highest diseases in 3 (three) last year showed that the case of hypertension was steadily increased, which in 2009 ranked the nine (9) of 10,211 (3.44%). In 2010 hypertension is 6 (six) rank; 15,431 (5.55%). In 2011, Hypertension badly occupied on the 7 (seven); 12 971 (4.76%). Meanwhile, based on the Surveillance Integrated Health Centers (STP) 2011-2013, the number of new cases of hypertension varied. In 2011 the number of new cases is 4256 (2145 male and 2111 female cases), and in 2012 the number of new cases is about 4121 cases (2012 male and 2109 female cases). In 2013 the case of Hypertension increased dramatically to 4876 cases (2865 male and 2011 female cases)[6]

An Initial study conducted in Gorontalo, 2013 showed that the prevalence of hypertension in Airnona Village was about 40%. The study also showed that 64% people with hypertension practiced unfavorable behavior, while people who are not diagnosed with hypertension

are about 46%. In Comparison to the study conducted in 2014, there were 35.07% of people with hypertension have a historical family of hypertension with low level of knowledge in terms of hypertension prevention. Other results showed that most of the respondents had bad behavior especially in doing exercise which accounted 48%; 66,5% had a bad habit in consuming salty foods, 76.1% consumed fatty foods, and 67.44% of respondents consumed alcohol and 32.1% smoked. Those risky Behaviors such as consuming fatty foods were existed and becoming an obligation for communities during traditional party and easily found in several restaurants in Gorontalo. People's behavior is mostly influenced by the culture in which some of the foods are should be presented on the traditional party and low level of the plant-derived food due the geographical condition and drought [9-11,14]

MATERIAL AND METHOD

The research was conducted in Gorontalo city during January to April 2015. The observational analytic study, with case-control study design is used to analyze the variables. The two-stage cluster random technique is used which then started from cluster neighborhoods (Rukun warga), and cluster neighborhood (rukun tetangga) and finally sample unit random. The sample size is about 150 people who have a historical family member with Hypertension, which then divided into two groups; 75 people with hypertension and 75 people are not hypertensive. Instruments used in the study is mercury tension meter to measure BP; twice and followed by interview using developed questionnaire. Structural equation modeling Variance-based or component based or Smart Partial Least Square (Smart-PLS) is used to analyze the study.

RESULTS

The study showed that Self-efficacy has a significant and positive effect on self-regulation. The fact can be observed from the positive path coefficient of 0,123 with T-statistic a value of 3,432 which is greater than 1,96. The study also showed that the self-efficacy's people in Gorontalo are high. The results showed 32,7% of respondents have the good perception of self-experience. Based on Hypertension status, self-experience was 26.7% in people with hypertension and 38.6% in people who are not diagnosed with hypertension is categorized as good. Other people's experiences, about 40,7% are a good category. While based on hypertension status, other people's experience who are diagnosed and are not diagnosed with hypertension is mostly categorized in good and very good, 52,0% and 29.3% successively. While for verbal persuasion, 24.7% of them are good category. For those with Hypertension, 29,3% have good verbal persuasion and 32,0% of those without hypertension have excellent verbal persuasion. For Emotional state variable; 40,0% respondents have good perception in terms of the emotional state.

Table 1. Overview of the Efficacy of the People of Gorontalo City. Year 2015

Self Efficacy	Category	Hypertension Status		Total N (%)
		Hypertension N (%)	**No Hypertension N (%)**	
Self experience	No good	9 (12,0%)	5 (6,7%)	14 (9,3%)
	Less good	7 (9,4%)	8 (10,7%)	15 (10,0%)
	Pretty good	20 (26,7%)	20 (26,7%)	40 (26,6%)
	Good	20 (26.7%)	29 (38.6%)	49 (32.7%)
	Very good	19 (25,2%)	13 (17,3%)	32 (21,4%)
	Total	**75 (100%)**	**75 (100%)**	**150 (100%)**
People Experience	No good	4 (5,4%)	2 (2,7%)	6 (4,0%)
	Less good	10 (13.3%)	7 (9.3%)	17 (11,3%)
	Pretty good	17 (22,7%)	14 (18,7%)	31 (20,6%)
	Good	22 (29,3%)	39 (52.0%)	61 (40,7%)
	Very good	22 (29,3%)	13 (17,3%)	35 (23.4%)
	Total	75 (100%)	75 (100%)	150 (100%)

Cont... **Table 1. Overview of the Efficacy of the People of Gorontalo City. Year 2015**

Verbal Persuasion	No good Less good Pretty good Good Very good	9 (12.0%) 10 (13,3%) 21 (28,1%) 13 (17,3%) 22 (29,3%)	4 (5,4%) 12 (16,0%) 19 (25,3%) 24 (32,0%) 16 (21,3%)	13 (8,6%) 22 (14,7%) 40 (26,7%) 37 (24,7%) 38 (25,3%)
	Total	75 (100%)	90 (100%)	150 (100%)
Emotional State	No good Less good Pretty good Good Very good	2 (2,6%) 5 (6,7%) 8 (10,7%) 30 (40,0%) 30 (40,0%)	2 (2,6%) 3 (4,0%) 10 (13,4%) 30 (40,0%) 30 (40,0%)	4 (2,7%) 8 (5,3%) 18 (12,0%) 60 (40.0%) 60 (40,0%)
	Total	75 (100%)	75 (100%)	150 (100%)

Other results showed that collective efficacy has the significant and positive effect on self-regulation. It can be observed from the positive path coefficient that is 0,312 with T-Statistic 10,651 which is greater than 1, 96. Community perception of Collective efficacy is quite high. The result revealed that 42,2% of community perception are good category. Based on diagnosis, 34.4% people with hypertension and (50.0 %) without hypertension are classified as good.

Self-regulation has a significant and positive effect on behavior prevention. The path coefficient exists on positive mark that is 0,765 with T-statistic value about 44.132, greater than 1.96. Community perception about self-regulation or self-management ability from external factors is counted at 18,71% unfavorable category. Moreover, 23,97% Hypertension people's self-management ability is bad category, while people without hypertension is counted at 22,3% regarding good enough self-management. For the Internal factors, 31.8% are pretty good.

Prevention behaviors showed a positive and significant effect on hypertension. This is evident from the marked positive path coefficient of 0,862 with T-Statistic valued at 417,621 greater than 1, 96. Behavior prevention practiced by people in Gorontalo City consists of weight control, diet, exercise/ sports, restrict smoking habits and doing leisure activities and hobbies. The results showed that 28,9 % people always doing such activity to control their weight. While, 30,9 % people who have already experienced Hypertension, does not do sufficient exercise, and 26,5% people without hypertension are always doing exercise. On the other hand 31.2% people cannot control diet (bad category). Regarding the hypertension status, 34,1% people with Hypertension cannot control their diet and 33,1% people without hypertension have good self-management in terms of diet control.

Exercise has strongly believed to control Hypertension. The study showed that 38,9% people have very good intention for exercise. Based on hypertension status, 42,6% diagnosed by Hypertension rarely do exercise, while for those without hypertension that is 40,3% are doing exercise (good category). Smoking is one of the modifiable factors for Hypertension. The study revealed that 59,4% respondent used to smoke. Moreover 61,4% respondents who diagnosed by Hypertension experienced to smoke, and 57,4% do not smoke. Another factor to control Hypertension is having more time for relaxation. The study found that only 36,0% respondents are using their leisure for relaxation.

Table 2 Preventative Behavior of Gorontalo City Year 2015

Preventive Behavior	Category	Hypertension status		Total N (%)
		Hypertension N (%)	No Hypertension N (%)	
Weight Control	No good	25 (33,3%)	19 (25,4%)	44 (29,4%)
	Less good	8 (10,7%)	11 (14,6%)	19 (12,6%)
	Pretty good	8 (10,7%)	10 (13,3%)	18 (12.0%)
	Good	8 (10,7%)	12 (16,0%)	20 (13,3%)
	Very good	26 (34,6%)	23 (30,7%)	49 (32,7%)
	Total	75 (100%)	75 (100%)	150 (100%)
Dietary habit	No good	29 (38,7%)	25 (33,4%)	54 (36,1%)
	Less good	11 (14,6%)	12 (16,0%)	23 (15,4%)
	Pretty good	1 (1,3%)	3 (4,0%)	4 (2.6%)
	Good	10 (13,4%)	13 (17,3%)	23 (15,3%)
	Very good	24 (32,0%)	22 (29,3%)	46 (30,6%)
	Total	75 (100%)	75 (100%)	150 (100%)
Exercise	No good	28 (37,3%)	30 (40,0%)	58 (38,6%)
	Less good	5 (6,6%)	4 (5,3%)	9 (6,0%)
	Pretty good	2 (2,6%)	5 (6,6%)	7 (4.7%)
	Good	4 (5,3%)	5(6,6%)	9 (6,0%)
	Very good	36 (48,0%)	31 (41,3%)	67 (44,7%)
	Total	75 (100%)	75 (100%)	150 (100%)
Smoking	No good	46 (61.4%)	43 (57,4%)	89 (59,4%)
	Less good	15 (20,0%)	21 (28,0%)	36 (24,0%)
	Pretty good	9 (12,0%)	5 (6,6%)	14 (9.3%)
	Good	0 (0,0%)	0 (0,0%)	0 (0,0%)
	Very good	5 (6.6%)	6 (8,0%)	11 (7,3%)
	Total	75 (100%)	75 (100%)	150 (100%)
Recreation/ Hoby	No good	13 (17,4%)	10 (13,3%)	23 (15,4%)
	Less good	27 (36,0%)	27 (36,0%)	54 (36,0%)
	Pretty good	15 (20.0%)	24 (32.0%)	39 (26.0%)
	Good	15 (20,0%)	10 (13,4%)	25 (16,6%)
	Very good	5 (6.6%)	4 (5,3%)	9 (6,0%)
	Total	75 (100%)	75 (100%)	150 (100%)

The average age of respondents (X) is 50.15 years, minimum 40 years and maximum 59 years and standard deviation (SD) 6,512. The average age of respondents with hypertension (X) 51, 27 years and standard deviation (SD) 6,024, and average age of respondent is not hypertension (X) 52,12 years and standard deviation (SD) 6,213.

Table 3. Age of Respondents in Gorontalo City, 2015

Age (Years)	Hypertension status		Total N (%)
	Hypertension N (%)	No Hypertension N (%)	
40-44	8 (10,7%)	6 (8,0%)	14 (9,3%)
45-49	14 (18,7%)	9 (12,0%)	23 (15,3%)
50-54	19 (25,3%)	21 (28,0%)	40 (26,7%)
55-59	34 (45.3%)	39 (52,0%)	73 (48,7%)
Total	75 (100%)	75 (100%)	150 (100%)

Table 3 shows most respondents aged 55-59 years (45.3%) and at least 40-44 years of age (10.7%). Based on hypertension status most (45.3%) respondents aged 55-59 years with hypertension and 52,0% who are not hypertensive.

Table 4. Inner Weight, Standard Deviations and Significance

Effect	Inner Weight	Standard Deviation	t statistic	Explanation
Self Efficacy-> Self Regulation	0,123	±0,044	3,432	Significant
Colective Efficacy-> Self Regulation	0,312	±0,028	10,651	Significant
Self Regulation-> behavior Prevention	0,765	±0,019	44,132	Significant
Behaviour Prevention -> hypertension	0,889	±0,002	41,954	Significant

Table 4 shows the value of T-statistics greater than 1, 96. It can be concluded that exogenous variables directly affects endogenous variables.

The results of the blood pressure measurements and then classified by the Joint sNational Committee VII, as shown in Table 5 :

Table 5. Blood Pressure Classification Society Gorontalo, Year 2015

Blood Pressure (mmHg)	Hypertension Status		Total N (%)
	Hypertension N (%)	no Hypertension N (%)	
Normal ≤ 120/80	0 (0,0%)	45 (60,0%)	45 (30,0%)
Pre Hypertension : 120 - 139 / 80 - 89	0 (0,0%)	30(40,0%)	30 (20,0%)
Hypertension stage 1: 140 - 159 / 90 – 99	40(53.3%)	0(0,0%)	40 (26,7%)
Hypertension stage 2: ≥160/ 110	35(46,7%)	0(0,0%)	35 (23,3%)
Total	75 (100%)	75 (100%)	150(100%)

The majority of respondents (53.3%) are categorized as stage hypertension and 46.7% are stage II hypertension and 60.0%) of people have normal Blood Pressure as shown in table 5.

DISCUSSION

Collective efficacy directly influences the self-regulation. Therefore, groups and family belief's will create individual trust manage and cope threats. Social support plays a crucial role to develop groups' ability to manage and control the group. Collective efficacy creates a trust relationship among community members and shared willingness to achieve goals. The capacity to do informal social control and social cohesion are the core factors to attain community objectives. Model of self-regulation is based on three components (interpretation, coping and appraisal) which connected each other to maintain balance. Consequence, if an individual is getting sick, according to the model the individuals then are motivated to recover. Motivation can be defined as internal and external factors including 1) the desire and interest to do the activities, 2) the encouragement and needs to perform activities, 3) the expectations and ideals, 4) self respect and appreciation, 5) good environment, and 6) the existence of interesting activities[2,3,].

Self-regulation affects on hypertension prevention behaviors. An Initial study to analyze the related factors to self-regulation; men and women were shown to have attitudes, subjective norm, and anticipated positive emotions to reduce and maintain blood pressure (Baghianimoghadam, et al, 2011). The Behavioral act or practice is focused on activities taken by individual in order to maintain health including knowledge, attitude and practice. There are four indicators for practice; (1) The act or practice related to infectious and non-infectious diseases, (2) The act or practice with respect to the factors that influence health, (3) the act or practice to access health care facilities, (4) the act or practice to avoid accidents both household accidents, traffic or in public places[8-11,14].

The results showed hypertension prevention behaviors directly affect hypertension. The study revealed that most of the respondents do not really care about hypertension prevention behaviors (bad category) such as weight controls behavior, diet control, and smoking. Even though some of the prevention behaviors are performed in a good way of practice such as exercise, and relaxing time, the practice of prevention behavior to Hypertension by people in Gorontalo is not fully executed. Most of the people used to drink alcohol and coffee, eating salty food, and excessive smoking which can interference body metabolism[12-15]

CONCLUSION AND RECCOMENDATIONS

In conclusion, Self-efficacy and collective efficacy directly affects self-regulation, and then influence the hypertension prevention behavior. It is therefore suggested to create health policy regarding health promotion to communities. Further research needed is to implement the prevention model to improve efficacy Self-efficacy and collective-efficacy.

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Relationships of B-RAF Immuno-Expression with Clinic Pathological Features in Patients with Colorectal Carcinoma in Wahidin Sudirohusodo Hospital Makassar

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ABSTRACT

Background: Colorectal Cancer is a malignancy that is due in addition to environmental factors, as well as genetic mutations. Oncogene mutation of B-RAF V600E plays an important role in the cascade of intracellular signaling pathways barriers mitogen-activated kinase protein in colorectal cancer. B-RAF mutations in colorectal cancer ranges from 5-20%. The purpose of this study was to determine immune-expression B-RAF V600E against clinic pathologic overview of colorectal cancer.

Materials and Method: This research is an analytic cross-sectional study on 40 cases of colorectal carcinoma cases. Immune-hystochemical staining of the B-RAF V600E thin piece of the tumor mass to evaluate their immune-expression B-RAF V600E and Chi-square test. Data were analyzed with SPSS 15.0 For Windows to determine the relationship immune-expression B-RAF with clinic pathologic. Then the data were tested using Spearman's statistical test. **Results:** Significance is determined by the value of $P < 0.05$. Of the 40 patients with carcinoma colorectal the staining immune-expression B-RAF V600E association remained immune-expression B-RAF V600E against gender ($p = 0.041$), tumor location ($p = 0.020$), TNM staging ($p = 0.011$) and the degree of differentiation ($p = 0.023$) but no significant relationship between immune-expression B-RAF and histopathological picture ($p = 0.090$).

Conclusion:immune-expression B-RAF significantly associated with clinic pathologic features of colorectal carcinoma and these data show immune-expression B-RAF V600E can be used as a standard clinical and pathological for better treatment against colorectal carcinoma.

Keywords: *Colorectal carcinoma, B-RAF, B-RAF V600E, immune-expression B-RAF, clinic pathologic, mutation, oncogen mutation, environmental factors.*

INTRODUCTION

Colorectal Cancer (CRC) is the world's third largest cancer in men after prostate cancer and lung cancer and second most common in women after breast cancer [1]. Until 1990 the TRC events around the world amounted to 9.4% of all cancer cases in men and 10.1% in women. CRC is more common in countries that are already developed than developing countries. There are incidents every year 945,000 new cases and mortality caused CRC reached the figure of 492,000 people each year, or 7.9% of all deaths in the world in 2000. It is a major public health problem worldwide and CRC became the number three cause of death worldwide The world after lung and breast cancer [1].

The Cancer Research UK in 2009 obtained 38 608 new cases each year in the UK CRC and CRC 333 330 new cases per year in the EU which is the second highest cause of death after lung cancer [1,2]. Although the development of the adjuvant treatment of late rapidly developing and highly developed, but only slightly improve survival in patients with CRC in advanced stages. Estimated 5-year survival rate of 65% in North America, 54% in Western Europe, 34% in Eastern Europe and 30% in India. About 6% of the American population is estimated to suffer from CRC in her life. Risk to suffer CRC began to rise over the age of 40 years and rose sharply at the age of 50 to 55 years, the risk doubled every next decade.

According to Vogelstein [2], carcinogesis CRC is an adenoma carcinoma sequence of adenoma carcinoma last so-called adenoma carcinoma sequence. Sequence runs vary even for decades. While Fearon [3] put forward the theory of genetic multistep model of carcinogenesis associated with CRC. It is based on the understanding that CRC is the result of a gene mutation. There are two models, namely Lost CRC journey of Heterozygocity (LOH) and Replication Error repair (RER). With the development of science and technology today, a molecular marker proved to be more useful than clinical and histopathological criteria in the selection of therapy [4]. There are three kinds of protein RAF who worked on the human body, namely: A-RAF, B-RAF, C-RAF (also called c-RAF-1), the third of these proteins depends on the activation segment of phosphorylation [5,6].

The trip is the most important molecular tests to identify the genes that cause dysregulation of cell proliferation, such as the B-RAF gene mutations result in the release of MAPK signaling and transcription-mediated cell division and survival. Today, the B-RAF mutation test has been used in routine clinical laboratory tests for a clear role as a condition of the occurrence of colorectal carcinoma[7]. Currently, only molecular methods such as Polymerase Chain Reaction (PCR) and limited only to facilities that can perform complex tests the molecular level, so it requires sophisticated equipment and professional operators. In Indonesia, the research on molecular biology in particular on the effects of BRAF mutations in TRC events are rare. Therefore conducted a study to determine the effect of B-RAF mutations in colorectal carcinoma in Wahidin Sudirohusodo hospital, Makassar. This research is preliminary and the results are expected to be the basis for further similar studies.

MATERIALS AND METHOD

Research methods

This study uses analytic cross sectional study design. The study was conducted at Hospital Wahidin Sudirohusodo, Makassar from January 2015 through January 2016

Population and Sample

All patients were treated at the CRC surgical FK UNHAS / RS Wahidin Sudirohusodo, began the period of January 2015 through January 2016, with a range of ages, genders and various clinical stages that have been proved histopathologically through a tissue biopsy.

Exclusion criteria:

Patients with colorectal cancer who had received prior chemotherapy, radiotherapy or surgery before. clinical data and histopathological incomplete Specimen insufficient research. The results of immunohistochemical examination is not perfect.

Data Analysis

From the data collected, further processed descriptively by calculating the percentage of BRAF mutations. Data were analyzed using SPSS 15.0 for Windows to determine the relationship between BRAF mutation with clinical stage, histopathological diagnosis and degree of differentiation. Then the data were tested using statistical test of Pearson Chi-Square. Significance is determined by the value of $P < 0.05$.

RESEARCH RESULTS

Characteristics of respondents

Table 1. Characteristics of respondents

Characteristics of respondents	n	%
Sex		
Male	25	62,5
Female	15	37,5
CRC **location**		
Ceacum	8	20,0
Ascendes	6	15,0
Transversum	4	10,0
Sigmoid	4	10,0
Rectum	18	45,0
Hispatology		
Adeno Ca	30	75,0
Adeno Ca Musinosum	7	17,5
Signet Ring Cell	3	7,5
Differential degree		
Good	11	27,5
Middle	17	17,5
Bad	12	7,5
Stadium TNM		
I	6	15,0
II	12	30,0
III	12	30,0
IV	10	25,0
B-RAF		

***Cont...* Table 1. Characteristics of respondents**

Negative	33	82,5
Positive	7	17,5
Total	**40**	**100**

Table 1 indicated that the subjects of this study consisted of 62.5% male and 37.5% female. CRC location most frequently encountered is in the area of the rectum 18 patients (45.0%), followed in the cecum area as much as 8 patients (20.0%), the ascending colon as much as 6 patients (15.0%), as well as tranversum colon and sigmoid colon respectively of 4 patients (10.0%). Based on the histopathology with HE staining, found patients with Adeno Carsinoma 30 patients (75.0%), then Adeno Carsinoma mucinous many as 7 patients (17.5%), and the least result Signet Ring Cell type PA as many as 3 people (7.5%).

Relationships Sex with Imunoekspresi B-RAF

Based on gender relations imunoekspresi patients with B-RAF (Table 2), obtained imunoekspresi negative B-RAF higher in male subjects as many as 23 patients (69.7%) compared to female subjects were 10 patients (30.3 %), while the B-RAF positive imunoekspresi higher in female subjects 10 patients (71.4%) than in male subjects 5 patients (28.6%).

Table 2. Relationships between sex with B-RAF Imunoekspresi

Sex	BRAF		Total	
	Negative	**Positive**		
Male	23 (69,7%)	2 (28,6%)	25	p = 0,041
Female	10 (30,3%)	5 (71,4%)	15	

Based on the test results of the relationship between the sexes with imunoekspresi B-RAF showed a significant relationship (p <0.041).

CRC **location Imunoekspresi relationship with B-RAF**

Data Table 3 show that the primary tumor site at the location of the rectum there were 18 patients (54.5%) with imunoekspresi BRAF negative and 0 patients ((0, 0%) with BRAF positive. In the sigmoid obtained 4 patients (12.1%) with imunoekspresi B-RAF negative and 0 patients ((0, 0%) with imunoekspresi B-RAF positive.

Table 3. Relationships between CRC**location with B-RAFImunoekspresi**

BRAF	**Rektum**	**Sigmoid**	**Transversum**	**Ascendens**	**Caecum**	**Total**
Negatif	18 (54.5%)	4 (12.1%)	3 (9.1%)	4 (12.1%)	4 (12.1%)	33 (100%)
Positif	0 (0, 0%)	0 (0,0%)	1 (14.3%)	2 (28.6%)	4 (57.1%)	7 (100,%)

P value = 0,020

In the transverse colon there were 3 patients (9.1%) with the B-RAF imunoekspresi negative and 1 patients (14.3%) with the B-RAF imunoekspresi positive. Based on the test results of the relationship between the location of the TRC with imunoekspresi B-RAF showed a significant relationship (p <0.020).

Histopathology relationship with Imunoekspresi B-RAF

In the group of mucinous adenocarcinoma histopathologic picture obtained 4 patients (12.1%) with the B-RAF imunoekspresi negative, and obtained three patients (42.9%) with the B-RAF imunoekspresi positive.

Table 4. Relationships between Histopathology with B-RAFImunoekspresi

BRAF	**Adeno Ca**	**Adeno Ca Musinosum**	**Signet Ring Cell Carcinoma**	**Total**
Negative	27 (81,8%)	4 (12,1%)	2 (6,1%)	33 (100,0%)
Positive	3 (42,9%)	3 (42,9%)	1 (14,3%)	7 (100,0%)

Keterangan : Nilai p = 0,090

In the group picture histopathology obtained Signet Ring Cell Carcinoma 2 patients (6.1%) with the B-RAF imunoekspresi negative, and obtained one patients (14.3%) with the B-RAF imunoekspresi positive. Based on the test results of the relationship between histopathology with imunoekspresi B-RAF showed no significant relationship (p <0.090)

Table 5. Relationships between Differensiasi degree with B-RAFImunoekspresi

BRAF	**Good**	**Moderate**	**Bad**	**Total**
Negatif	11 (33,3%)	15 (45,5%)	7 (21,2%)	33 (100,0%)
Positif	0 (0,0%)	2 (28,6%)	5 (71,4%)	7 (100,0%)

P value = 0,023

Table 5 Shows histopathological grading in patients with a good degree of differentiation of 11 patients (33.3%) with the B-RAF imunoekspresi negative, and 0 patients (0.0%) with the B-RAF imunoekspresi positive. In patients with moderate degrees of differentiation 15 patients (45.5%) with the B-RAF imunoekspresi negative, and 2 patients (28.6%) with the B-RAF imunoekspresi positive. Patients with the degree of differentiation ugly 7 patients (21.2%) with the B-RAF imunoekspresi negative, and 5 patients (71.4%) with the B-RAF imunoekspresi positive. Based on the test results of the relationship between the degree of differentiation with imunoekspresi B-RAF showed no significant relationship (p <0.023).

TNM Stage relationship with Imunoekspresi B-RAF

In Table 6, patients with stage I, there are 6 patients (18.2%) with the B-RAF imunoekspresi negative, and 0 patients (0.0%) with the B-RAF imunoekspresi positive. In patients with stage II there were 12 patients (36.4%) with the B-RAF imunoekspresi negative, and 0 patients (0.0%) with the B-RAF imunoekspresi positive. In patients with stage III there were 10 patients (30.3%) with the B-RAF imunoekspresi negative, and 2 patients (28.6%) with the B-RAF imunoekspresi positive. In patients with stage IV there were 5 patients (15.2%) with the B-RAF imunoekspresi negative, and 5 patients (71.4%) with the B-RAF imunoekspresi positive. Based on the test results of the relationship between the TNM staging imunoekspresi B-RAF showed no significant relationship (p <0.011)

Table 6.Relationships between TNMStadium and B-RAFImunoekspresi

BRAF	**I**	**II**	**III**	**IV**	**Total**
Negative	6 (18,2%)	12 (36,4%)	10 (30,3%)	5 (15,2%)	33 (100,0%)
Positive	0 (0,0%)	0 (0,0%)	2 (28.6%)	5 (71,4%)	7 (100,0%)

P value = 0,011

DISCUSSION

A total of 40 subjects CRC patients who met the inclusion criteria, which is then examined imunoekspresi B-RAF by immunohistochemistry. Of these 40 patients, found men more than women, with 25 male and 15 female, and the average patient age of 55 ± 12 years. Obtained youngest age 32 years old and the oldest 83 years of age. The average age of patients in this study were younger than the average age of patients CRC national data held in Makassar in 2011. In this study, subjects aged under 40 years and under as much as 20% (8/40) in comparison with research the other, the result is high enough young patients under 40 years. Anatomic pathology found that this malignancy ranks 8 out of 10 malignancies, with the highest incidence of men. Reports of 4 parts Pathology Anatomy of the four education centers in Indonesia in 1995 found that the peak incidence of CRC are in the age range of 33-44 years for women and 55-64 in men. Zhang [8] in a study of 293 patients with CRC in Sweden, getting an average age of 69 years patient with age range of 33-93 years. Liang et al [9]in China in a study of 115 patients with CRC, reported that six patients aged under 40 years, 36 patients aged 40 to 59 years and the remaining 27 people aged 60-80 years. While there is no definitive data on the incidence of this malignancy in Indonesia, but the report found an increase in the number of cases of the TRC annually.

CRC location most frequently encountered is in the rectum by 45%, 20% next cecum in the sigmoid colon 10%, 15% ascending colon, transverse colon 10%. The results of this study are not much different from the general distribution of CRC acquired on the published literature, as reported by [10]. According to Shin A in his finding[11] also report the location of colorectal adenocarcinoma in Korea from 1999-2009 found most locations in the rectum, colon distal and proximal colon. Study by Kalady et al,[12] B-RAF mutation found in most colon cancer than cancer of the rectum and more in the proximal colon than the distal colon. Moreover, mutations in BRAF specific for sporadic disease, the mutation status as an exclusion criterion for suspicion of Lynch syndrome / hereditary nonpolyposis colorectal cancer. According to Shin : Zlobec, et al., [11, 13], BRAF mutations have a significant relationship with the location of the right colon tumors with MSI-H cancers and colon tumors with the largest diameter [14-16].

In this study, the B-RAF stratification and prognostic evaluation of colorectal cancer were made for right versus left for mutation relationship with proximal tumor location. The most important finding is the result of a negative B-RAF mutations are strong in patients with right colon cancer, and separately with MSI status. Some evidence supports the B-RAF mutation separateness from MSI. First, some authors have reported the results of clinical and poor treatment in patients with colorectal cancer in the case of MSS and MSI-H with B-RAF mutations. Secondly, recent work by Velho et al examined the B-RAF mutation, KRAS and PIK3CA on Serrated colorectal cancer and polyps. They postulate that mutations in BRAF have tended to precede MSI carcinomas since the frequency of mutations in Serrated polyps similar to MSI cancers but were statistically different from the frequency of tumor MSS. Third, a similar discovery was observed by Kim et al that describes B-RAF mutations are not associated with CIMP and MSI on Serrated polyps.

CONCLUSION & RECOMMENDATIONS

Based on the research that has been conducted on 40 patients with TRC, then the conclusion is obtained as follow: No significant association between imunoekspresi B-RAF with the results of anatomic pathology in patients with CRC, a significant association between imunoekspresi B-RAF with gender, tumor location, TNM stage and degree of differentiation in patients with CRC.

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Application of the Batho Pele Principles as a Quality Management Tool in HIV-AIDS Healthcare in South Africa

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ABSTRACT

HIV-AIDS continues to bear a high disease burden in many developing countries including South Africa which has the greatest disease prevalence. The only way to counteract the devastating effects of this disease is to ensure adequate point of care HIV diagnosis and referral to timely care through HIV-AIDS programmes. The South African state HIV-AIDS programme is currently the largest programme in the world as it provides HIV-AIDS services to almost 7 million South Africans .Quality management systems in healthcare is therefore a pre requisite to ensure safe and efficacious HIV –AIDS care is provided to those affected and infected by HIV-AIDS. One such quality management tool proposed is, the application of the Batho Pele principles as a quality management tool in HIV-AIDS healthcare. The Batho Pele initiative aims to enhance the quality and accessibility of government services by improving efficiency and accountability to the recipients of public goods and services. The Batho Pele ("People First") principles are aligned to the South African constitution. All government officials must follow the "Batho Pele" principles which require public servants to be polite, open and transparent and to deliver good service to the public. Batho Pele requires that nine service delivery principles be implemented regarding consulting, service standards, courtesy, information delivery transparency and value for money. This is a an exploratory article which reviews the literature available to assess the alignment of the Batho Pele principles as a quality management tool in HIV-AIDS healthcare towards building good leadership and clinical strategic direction in South Africa.

Keywords: *Batho Pele, HIV-AIDS, quality management, service standards*

INTRODUCTION

The presence of quality healthcare frameworks in the various facets of healthcare remains elusive. Quality measurements in healthcare can be subjective and is often dependant on clinical discretion. However, in order to appropriately measure and evaluate the value of health service delivery, it is imperative to ensure optimal healthcare frameworks are utilised. Frameworks are dependent on the context of the health programme being evaluated. This paper explores a few of the salient healthcare frameworks commonly used in the healthcare context and discusses the Batho Pele initiative as a means to utilise this as a quality healthcare tool. In order to better understand the context of this stance, this paper will discuss the South African healthcare structure, provide an overview of Quality management in healthcare, discuss the ISO 9001 Standard and expand on the principles of the Batho Pele. This paper concludes with recommendations for best practises.

LITERATURE REVIEW

The South African healthcare structure

Adults and Children estimated to be living with HIV-AIDS (2015) totals 36.7 million globally. Eastern and Southern Africa totals the highest globally with 19 million. HIV-AIDS continues to bear a high disease burden in many developing countries including South Africa, which has the greatest disease prevalence, In 2016, South Africa had 270 000 (240 000 - 290 000) new HIV infections and 110 000 (88 000 - 140 000) AIDS-related deaths. There were 7 100 000 (6 400 000 - 7 800 000) people living with HIV in 2016, among whom 56%

(50% - 61%) were accessing antiretroviral therapy [7.]

South Africa has the largest HIV epidemic in the world, with 19% of the global number of people living with HIV, 15% of new infections and 11% of AIDS related deaths and further to this, South Africa has the largest treatment programme in the world, accounting for 20% of people on antiretroviral therapy globally. The country also has one of the largest domestically funded programmes, with about 80% of the AIDS response funded by the government.

The National Strategic Plan for HIV, TB and STIs 2017–2022 aims to accelerate progress towards meeting the Fast-Track Targets by: reducing new HIV infections; improving treatment, care and support; reaching key and vulnerable populations; and addressing the social and structural drivers of HIV, tuberculosis and sexually transmitted infections[6.]

In order to appropriately measure and evaluate the value of health service delivery, it is imperative to ensure optimal healthcare frameworks are utilised. The South African Department of Health (DoH) provides leadership and coordination of health services to promote the health of all people in South Africa through an accessible, caring and high quality health system based on the primary healthcare (PHC) approach [2.]South Africa's health system consists of a large public sector, a smaller but fast growing private sector and an NGO sector.

The foundation of the South African public health system is the primary healthcare clinics that are the first line of access for people needing healthcare services. These clinics provide their services free. Access to clinics has improved significantly since 1994 but in many instances, the quality of health care provided at this level has fallen. The next tier of the public healthcare system in South Africa are the district hospitals to which patients are referred from primary healthcare clinics when they need more sophisticated treatment. At the tertiary level are the academic hospitals where advanced diagnostic procedures and treatments are provided. These also serve as training institutions for healthcare providers. The annual expenditure of the public healthcare sector is around R122.4-billion to serve 84% of the population, or 42-million people, who are dependent on the public health care sector for services[2.]

The private healthcare system entails healthcare professionals who provide their services on a private basis, usually funded by the subscriptions of individuals to medial aid schemes. Private healthcare practitioners also provide services through private hospitals. The private healthcare sector spends around R120.8-billion annually to cover 16.2% of the population or 8.2-million people, many of whom have medical cover [2.]

In South Africa, private and public health systems exist in parallel. The public system serves the vast majority of the population, but is chronically underfunded and understaffed. The wealthiest 20% of the population use the private system and are far better served. A Primary Health Care Clinic is the first step in the provision of health care and offers services such as immunisation, family planning, anti-natal care, and treatment of common diseases, treatment and management of Tuberculosis, HIV/AIDS counselling, amongst other services. If the clinic cannot assist, they will refer the patient to a Community Health Centre. A Community Health Care Centre is the second step in the provision of health care but can also be used for first contact care. A Community Health Care Centre offers similar services to a Primary Health Care Clinic with the addition of 24 hours maternity service, emergency care and casualty and a short stay ward. The Community Health Care Centre will refer a patient to a District Hospital when necessary. This is the third step in the provision of health care. These hospitals will normally receive referral from and provide generalist support to community health centres and clinics such as diagnostic, treatment, care, counselling and rehabilitation services. Most care is delivered by doctors and primary health care nurses. If the District Hospital cannot help a patient they will be referred to the local Regional Hospital for treatment. This is the second level of health care. These hospitals will normally receive referral from and provide specialist support to a number of district hospitals. If the Regional Hospital cannot help they will refer to the Provincial Tertiary Hospital [2.]

Quality management in healthcare

A wealth of knowledge and experience in enhancing the quality of health care has accumulated globally over many decades. In recent years, quality management has become significant in the global and South African healthcare sector as a means to improve effectiveness of treatment and increase patient satisfaction within health service delivery. Quality management in healthcare

focuses on the oversight of programmes that improve patient care, and safety, resource utilization, and ancillary services [1].

Healthcare organisations are increasingly becoming committed to provision of quality healthcare for all. Quality and commitment to quality is a core value and key business strategy for most private healthcare facilities [5].Most South African private healthcare facilities have committed to clinical excellence, quality service, respect and empathy for their patients to ensure that patients receive world class clinical care, and ensure that the patient experience addresses the needs of patients and their families[5]. In South Africa, although this proactive change is seen more in the private healthcare sector, similar efforts are being made in the public healthcare sector in South Africa.

In the South African private health sector, quality, health and safety is an integral part of an organisations service delivery. Private sector employees play an integral role in creating and developing the quality culture in the private hospitals and contribute to the sustainability of the quality management system. Enhancing the customer experience and the working environment for all private sector health employees supports the purpose of making life better in these health environments [5].Quality management deals with delivering consistent quality, which, in turn, requires reliable processes. Reliability requires strong leadership commitment with the existence of performance goals, risk reduction procedures, quality improvement policies, quality measurement systems and reward mechanisms [5].The following discussion highlights some of the best practice interventions that assists in improving healthcare in South Africa.

The ISO 9001 Standard

The ISO 9001 standard is one of the most versatile, well known and commonly applied quality management systems. ISO 9001 standards, launched in 1987 is a generic management system standard. ISO 9001 is a standard that sets out the requirements for a quality management system and has been implemented across various industries globally [4].In recent years there has been much emphasis on adaptation of ISO standards into the healthcare arena. This has been of particular importance due to the ISO standard promoting global harmonization of medical practices by supporting efficient exchange of information and protection of data toward ultimately protecting the health and safety of patients and healthcare providers and improving the quality of care[4]. ISO 9001 is based on the idea of continual improvement and helps businesses and organizations be more efficient and improve customer satisfaction. A new version of the standard, ISO 9001:2015 has replaced the previous version (ISO 9001:2008) and allows implementing organisations to work in more efficient ways with process alignment which increases productivity and efficiency, bringing internal costs down[4].

The ISO 9001 standard has seven principles which are embodied in the principles of quality management systems:

Customer focus: meeting and exceeding customer needs is the focus of quality management by understanding the present and future needs of customers. With relevance to HIV-AIDS healthcare sector this implies understanding the customer or patient, understanding the nature of their disease burden and developing HIV-AID interventions to mitigate the impact on them and their communities.

Leadership: the ISO standard dictates strong qualities for leaders to establish purpose and direction in management of healthcare programmes. This is crucial in ensuring that HIV-AIDS programmes meet necessary goals and objectives.

Engagement of people: this ISO quality management principle aims to encourage the involvement of people at all levels in all stages of programme development and this also bears relevance to the objectives of this research study dealing with stakeholder management and capacitation.

Process approach: this principle is based on the premise that organisations are more efficient and effective when they utilise a process approach to manage activities and related resources towards optimal goal realisation. This is pivotal in the backdrop of HIV-AIDS clinical management where consistent and standardised healthcare is required.

Improvement: the ISO standard proposes that continual improvement should be a permanent objective of an organisation or facility. Given the dynamic changes occurring globally driven by international HIV-AIDS research and literature, it is imperative that HIV-AIDS

programmes continually evolve to include best clinical practises towards optimising patient care.

Evidence based decision making: the ISO standard suggests the use of factual data related to important current evidence bases to conclude management decisions on. This standard when applied to HIV-AIDS programmes imply the ad hoc and continuous updating of clinical guidelines to steer evidence based decision making.

Relationship management: the ISO standard bases its recommendation that all stakeholders and partners in organisations/facilities are interdependent and mutually beneficial relationships enhance the ability for value creation. As with all programmes in health care, HIV-AIDS programmes call for harmonised relationship management with all stakeholders as is echoed in this research study's objective to describe the role and capacitate all stakeholders involved in HIV-AIDS programme management.

The South African department of health's system was reviewed and retrospectively assessed to ascertain the current quality management tool in place for accurate measurement in the healthcare sector.

The Batho Pele principles

The Batho Pele ("People First") principles are aligned to the Constitution – know the service you're entitled to. Government officials must follow the "Batho Pele" principles which require public servants to be polite, open and transparent and to deliver good service to the public. Batho Pele, a Sesotho word, which means "People First", is an initiative that was launched in 1997 to transform the Public Service at all levels. Batho Pele was launched because democratic South Africa inherited a Public Service that was not people-friendly and lacked the skills and attitudes to meet the developmental challenges facing the country.

In the struggle to transform the Public Service, the old culture has to be changed to ensure that our people are served properly, that all staff work to their full capacity and treat state resources with respect [3.] The following principles provide an overview:

Consultation-Citizens should be consulted about the level and quality of the public services they receive and, wherever possible, should be given a choice about the services that are offered.

Service standards-Citizens should be told what level and quality of public service they will receive so that they are aware of what to expect.

Access-All citizens should have equal access to the services to which they are entitled.

Courtesy-Citizens should be treated with courtesy and consideration.

Information-Citizens should be given full accurate information about the public services they are entitled to receive.

Openness and transparency- Citizens should be told how national and provincial departments are run, how much they cost and who is in charge.

Redress-If the promised standard of service is not delivered, citizens should be offered an apology, a full explanation and a speedy and effective remedy; and when complaints are made, citizens should receive a sympathetic, positive response.

Value for money-Public services should be provided economically and efficiently in order to give citizens the best possible value for money.

CONCLUSIONS

Strong leadership, political will, social mobilisation, adequate human and financial resources, and sustainable development of health-care services are needed for successful implementation of The Batho Pele principles in order to achieve maximum successes. While there are significant challenges facing the overall healthcare system, both public and private sector reforms can start to address inequalities within the system, focusing on delivering accessible and high quality primary healthcare, making private healthcare more affordable to the general population, and linking the two into a sustainable, effective and integrated South African healthcare system.

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Conflict of Interest - NIL

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Relationships between Smoking Habits and the Hypertension Occurrence among the Adults of Communities in Paniai Regency, Papua Indonesia

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ABSTRACT

Hypertension is one of the leading causes of death in people in the world. The prevalence of hypertension has reached 31.7% of all residents. This increase is due to lifestyle changes that one of them smoking. The purpose of this study to determine the relationship between smoking habits including smoking, the number of cigarettes and types of cigarettes with hypertension.

The research design is cross-sectional study. The number of subjects as many as 40 people taken in multi stage random sampling. Instruments in this study is a questionnaire for respondents' data and characteristics of smoking habits, and sphygmomanometer to measure blood pressure. Data were analyzed by chi-square test with p <0,05 for significance. The result showed that there was a correlation between smoking habit and hypertension (p = 0,003) that was influenced by smoking time (p = 0,017) and cigarette type (p = 0,017), but there was no correlation between cigarette number and hypertension (p = 0,412). Because smoking habits increase the risk of hypertension, health counseling about the risk of increased blood pressure to hypertensive sufferers who have smoking habits should be done. This is necessary in order to decrease the incidence of hypertension. There is a relationship between smoking with hypertension, smoking habits increase hypertension patients in paniai.

Keywords: *hypertension, smoking habit, smoking duration, number of cigarettes, type of cigarette*

INTRODUCTION

Tobacco smoking has been identified as the most important source of preventable morbidity and premature death and the primary cause of health inequalities between socioeconomic groups in most high-income countries[1-3]. The number of smokers in the world reaches one billion people. In general, there is an increase in cigarette production despite a decrease in high-income countries. More than 80% of the world's smokers living in low- to middle-income countries. Cigarettes killing about 5.4 million people each year and one person each second [4-6] Prevalence of smokers in Indonesia in the year 2010 by 34.7%. In 2010 the largest prevalence of smokers in Indonesia is found in Central Kalimantan Province as much as 43.2% and the lowest in the Province Southeast Sulawesi as much as 28.3%. Central Java province itself has a smoker prevalence of 32.6%. District Karanganyar has a smoker prevalence of 29.3% [7,8.]

Men (65.9%) had a prevalence of 16 times greater in number smokers than women (4.2%). Number of smokers also found more many in rural areas, people with low education, informal employment eg as farmers / laborers / fishermen and low economic status [8]. Prevalence of hypertension in Indonesia obtained through measurement at age ≥18 years of 25.8%, highest in Bangka Belitung (30.9%), followed by South Kalimantan (30.8%), East Kalimantan (29.6%), West Java (29.4%) and Central Java (26.4%). The prevalence of hypertension in Indonesia obtained from questionnaires was diagnosed on labor for 7.8%. Some previous research showed no association between smoking and hypertension, where there was no significant difference between blood pressure in people who smokers and non-smokers. There are also several theories that explain smoking relationship with hypertension [9].

The influence of cigarettes can cause hypertension affected by the content or substances contained in the cigarettes include nicotine and carbon monoxide. Smoking causes sympathetic activation, oxidative stress, and acute vasopressor effects that increase inflammatory markers associated with hypertension. The mechanism of cigarettes that cause hypertension is mainly seen from the consumption of cigarettes in a long time.[10,11]

MATERIALS AND METHOD

This correlation research is applied design of case control study. The population was Paniai residents who have hypertension and have a history of smoking in the past amounted to 40 people. The number of research samples was 30 respondents, with criteria of Paniai residents included in the sample: with blood pressure of 140/90 mmHg, have a smoking history, men > 40 years old, willing to be respondents voluteerly. Sample technique used is purposive sampling. Independent Variables are Smokers and Dependent Variables are Hypertension. The steps used in this study are: 1. Preliminary study at Paniai Puskesmas to identify the population and sample of research that affected by hypertension. 2. Measure blood pressure. 3. Provide a statement letter of willingness to be respondents and questionnaires to respondents. Explaining how to fill out the questionnaire, then the researchers collect and re-examine the completeness and the questionnaire filled completely by the correspondent. The application of questionnaire with 7 questions about smoking habit that is the number of cigarettes smoked per day, knowledge about the dangers of smoking, smoking and 1 question about hypertension. Data Analysis was performed by using chi square test (X2) with a = 0,05 and 95% Confidence Interval (CI).

RESULTS

Respondent Characteristics

Table 1. Distribution of respondents by level of education in Paniai City, 2017

Educaion	Number (Person)	Prosentase
Basic school Junior high school no school	28 1 11	60 % 2.5 % 27.5 %
Total	**40**	**100 %**

From the data collection that has been done, the highest education level of respondents is SD (28%) and the lowest is Junior High School (1) (2.5%).

Table 2: Distribution of frequency of respondents by Work in Paniai City, 2017

Occupation	Number (Person)	Percentage
Laour Farmer Civil Servant	14 20 6	35 % 50 % 15 %
Total	**40**	**100 %**

From collecting data that has been done, the highest number of respondents on the level of labor work is 14 people (35%) and the lowest number of respondents with job as civil servant is 6 people (15%).

Univarat Analysis

Table 3: Distribution of respondents by smoking habit among male residents in Paniai City

Smooking of cigarette	Number (Person)	Prosentage
1-10 /day 10 – 20 /day > 20 /day	3 20 17	7.5 % 50 % 42.5 %
Total	**40**	**100 %**

From the results of data collection tenteng smoking habit of men aged> 40 years in Paniai obtained data that of 40 respondents who categorized have the most smoking habit that is> 20 stems / day a number of 20 people (50%) while those who have the lowest habits of 1-10 stem / day there are 3 people (7.5).

Table 4: Frequency distribution according to hypertensive disease suffered by men aged> 40 years in Paniai City.

Category	Number (Person)	Prosentase
140/90 mmHg – 159 /99 mmHg 160/100 mmHg – 179/109 mmHg ≥ 180/110 mmHg	12 21 7	30 % 52.5 % 17.5 %
Total	**40**	**100 %**

From the result of data collection of hypertensive

disease suffered by men aged > 40 years in Paniai City got data that from 40 respondents who suffer most hypertension with category 160/100 mmHg - 179/109 mmHg is 21 people (52.5%), whereas respondents who suffered the least hypertension was in the category ≥ 180/110 mmHg ie 7 people (17.5%).

Analysis of Bivarat

Table 5. Relationship between Smoking Habit With hypertension disease

Smoking habit	Hypertension			Total
	140/90 – 159/99 (mild)	160/100 – 179/109 (middle)	> 180/110 (heavy)	
1-10 / day (mild)	1	2	0	3
10 – 20 / day (middle)	10	3	0	13
> 20 / day (heavy)	0	10	14	24
Total	11	15	14	40

Table 6 : Result of Chi – Square Tests calculation

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	19.432a	2	.000

a. 3 cells (48,8%) have axpected count less than 5. the minimum expected count is 3.15.

From the research results can be found that there is a relationship between smoking habits with hypertension disease.

DISCUSSION

Based on the work, the population in Kkota Paniai got most of the work as farmers that amounted to 20 people (50%). Then the second work as laborers are 14 people (35%), and the other PNS 6 oarng (15%). The low level of education affects the type of work that causes the type of work they get is also low as a farmer and laborer. Work is an activity that a person has to make money [13,14]. A profession owned by a good child, adult, or parents who can make money, Satisfaction, insight and skills that usually for everyday life in the form of clothing, food and boards, Based on the results of data collection conducted on 40 respondents obtained data that respondents have a smoking habit that is categorized as medium and heavy smokers respectively 10-20,> 20 cigarettes / day which amounted to 20 people and 17 people. According to Lasiyo [15,16], smoking is a habit of smoking cigarette smokers who do some of the reasons that want to try - try - follow-up parents / adults who smoke and association. According to Adib [17] the levels of nicotine contained in cigarettes are very harmful to the body, nicotine causes liming on blood vessel walls causing high blood pressure. Active smokers are the designation for people who smoke. Most of the residents become heavy smokers due to low work rates and decreased productivity makes residents become stress and vent with smoking. From the results of data collection we do most of the respondents have hypertension disease. For the largest sequence were respondents with moderate hypertension disease with a range of 160/100 mmHg-179/109 mmHg in number (52.5%), whereas respondents who have hypertension disease weight category that is ≥ 180/110 mmHg is (17.5%) and the rest in categorize respondents with mild hypertensive disease 140/90 mmHg-159/99 mmHg, (30%). Hypertension is a condition in which a person's blood pressure systolic over 140mmHg and diastolic blood pressure more than 90 mmHg and as a trigger for the onset of other more severe diseases. Meanwhile, according to [14], hypertension is a condition in which a person has increased blood pressure that has continued symptoms in human organs causing more damage.

If hypertension is not overcome it will arise some complications, among others, coronary heart disease, heart failure, brain blood vessel damage and stroke. Hypertension is a condition in which a person experiences an increase in blood pressure above normal that causes morbidity and mortality. According to WHO normal limit of systolic blood pressure is 120-140mmHg and diastolic takanan is 80-90 mmHg. A person is said to have hypertension when his blood pressure is above 140/90 mmHg [6]. This study show that there is a correlation between smoking habit with hypertension disease they suffered. Shown with chi square test result 19.432a. Data from Puskesmas or hospitals in Paniai indicates that hypertension rates in the community are quite high. This is influenced by smoking habit that most citizens do. Another study indicated that an increase in

occupational stress was associated with an increased risk of hypertension after other factors were adjusted [18].

With a low educational background they tend not to know that cigarettes are harmful to the body and can lead to an increase in blood pressure. Similarly study by [19] shown that such ethnic disparities were more evident in the elderly population. Avoidance of excessive alcohol consumption and better education were favorable lifestyle for reduction in risk of hypertension. In addition, demographic characteristics were obtained from a questionnaire. Blood pressure and anthropometric indices were measured, and serum indices were analyzed [20]. Most of the hypertension patient in Paniai was male, this also occur in Siamen China where the study found that sex-specific occupational disparities exist in the association between self-reported salt-eating habit and hypertension in older individuals [21]. This enforce with the study by Wang et.al., indicated that gender, age, nation, occupation, education, overweight or obesity, abdominal obesity, diabetes, hyperlipidemia, hypercholesterolemia, high LDL-C were positively correlated with hypertension. [22]

In cigarettes there are substances that are harmful to the human body such as Nekotin that can cause the calcification of the blood vessels so that the blood vessels become narrow and the blood rate will become faster. Meanwhile, according to IARC [12], substances that are harmful to the human body contained in cigarettes, among others: Tar that can increase the viscosity of blood (there is also a substance of sticky hydrocarbons sticking to the lungs - lung). So, force the heart pumping blood even stronger. Nicotine can affect the nerves and blood circulation that are karsingen and which can trigger lung cancer is deadly. Nicotine can also stimulate the release of cathecolamin substances such as the body of the hormone sadrenaline. The adrernal hormone stimulates the heart's work to beat 10 to 20 times / min and increases blood pressure from 10 to 20 scales. This results in increased blood volume and a faster fatigue. This substance also causes a sense of addiction to continue smoking. Carbon monoxide is a substance that binds hemoglobin in the blood, making the blood decrease in the binding of O2. this substance can also increase the acidity of blood cells so that the blood becomes more viscous and stick to diidnding blood vessels. The narrowing of the blood vessels forces the heart to pump blood faster so that the bloodline increases. It is recommended that health personnel and stakeholders take primary action that is preventive and promotive to prevent hypertension by conducting health education about hypertension disease and relationship with smoking habit at society in Paniai City [23,24].

CONCLUSION

Most of the men in paniai are smokers. Especially men> 40 years old. Hypertension Disease Most men> 40 years of age in Paniai City have hypertensive disease. From the research that has been done on the residents can be concluded that there is a relationship between smoking habits with hypertension disease.

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A Study on Challenges Faced by IT Organizations in Business Process Improvement in Chennai

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ABSTRACT

Infrastructure is the backbone of IT industry. If this is not in good place the delivery with efficient testing will not be possible. This paper specifically focus on challenges faced by IT managers in reputed IT organization in Chennai. This study collected data related to infrastructure challenges from IT executives till director level and based on the research walk though certain possible solutions around to mitigate some of these challenges. Here trying to tackle some of the open issues first by performing analysis with the data collected from the operations done in IT infrastructure to understand the underlying basic issues and propose nearby solutions to mitigates

Keywords: *Software engineering, acquisition, Cloud computing, Docker container technology*

INTRODUCTION

Education either has not been spared in fact Kuboni (2012) Observes that, today, technology is a significant driver behind change, and sometimes plays an important role in innovations in educational design and delivery. There are immense possibilities for greater and wider-spread change with the use of present-day technological advancements, as well as with the implementation of innovative educational programs. The challenge is to ensure that innovation plays a constructive role in improving educational opportunities for billions of people who remain under-served in a rapidly developing world[1]. Today, educators have the challenge of monitoring changes in technologies, determining if they apply to learners living in 'the real world,' and seeking ways to use technologies to complement and support instructional methodologies and practices.

REVIEW OF LITERATURE

Matthews, Judy H. (2003) concluded the study globalised competitive world, organizations are looking for ways to gain or maintain a competitive advantage in the marketplace of the important challenges facing firms and organizations three are of prime importance: (1) for organizations to know what they know and maximize the transfer of this knowledge throughout their organization; (2) finding ways of working which assist in maintaining their competitive advantage and finding new ways of gaining competitive advantage often through innovation, and (3) continuously learning through the exploitation of existing resources and capabilities and the exploration of new resources and capabilities to improve their performance. These challenges are interrelated. This paper investigates some of the extensive literature on innovation and knowledge management and suggests proposition ns for future research. Lance Revenaugh (2006) implementation is the challenge that comes at the end of all new (and old) methods for improving organizations. Strategic planning, total quality management, new information systems technologies, and now business process reengineering (BPR) are some of the concepts that are being advocated to effect a radical improvement in organization performance. BPR is a radical rethinking of an organization and its cross functional, end to end processes, and has taken corporations by storm. Despite the excitement over BPR, however, the rate of failure for reengineered projects is over 50 per cent. Why does a concept that is becoming so pervasive have such a large probability of failure. Uses two well established models of organizational analysis, the information technology

strategic grid and the corporate tribes culture model, to provide some insight into the difficulty of implementing BPR successfully. Potential impacts of each culture type are specifically analysed. Examines the strategic relevance of a process, as delineated in the strategic grid, for its relationship to BPR implementation. Integrates the combined impact of culture and strategic relevance into a practical framework to guide managers in planning for the successful implementation of BPR.

The specific objectives of the study are:

To identify the relationship between the type of organization , experience and various domains related to IT process

To identify the suggestion related to methodologies and tools are using to improve the business process through Centers of Excellence.

To recommend the best practices followed by the organization to achieve effective business expectation.

Analysis and Interpretation

Statistical analysis is the process of collecting, analyzing and interpreting the numerical data. It is one of the basic steps of research process. In this chapter, the investigator uses the mean, standard deviation,'t' test, F-test, correlation and Regression analysis to analyze the data. Analysis of data means studying the tabulated material in order to determine inherent facts or meanings. It involves breaking down existing complex factors into simple parts and putting the parts together in new arrangements for the purpose of interpretation[2]. A plan of analysis could be made in advance before the actual collection of data. The collected data have been analysed and the results are given as follows:

DESCRIPTIVE ANALYSIS

It involves computing measures of central tendencies such as, mean and the measures of variability like standard deviation. The computed values are used to describe the properties of a particular sample and the descriptive statistics is used to reduce mountains of data to a manageable size.

DIFFERENTIAL ANALYSIS

It involves the most important procedure by which the researcher makes inferences between groups with reference to selected variables. It involves't' test and 'F' test. A 't' test is a numerical procedure that takes into account the size of the differences between the means of two groups, the number of subjects in each group, and the quantum of variations of spread present in the scores. Thus, the't' test is a technique for determining whether the performance of two groups is significantly different or not.

To determine whether there are significant differences among the means of more than two groups ANOVA is employed. The ANOVA yields the 'F' value. 'F' value is used to find out whether there are significant differences between the means of the different groups. The hypotheses are tested at 0.05 level.

CORRELATION ANALYSIS

The relationship existing between two variables is found out by using correlation method. There are several indices of relationship. In this study, product moment correlation co-efficient method is used. The hypotheses are tested at 0.05 level. It is inferred from the table that based on type of organization, 66.6 percent of the respondents are medium and 33.4 percent of the respondents are large. The details of Mean, S.D. and t-value for respondent's level of test management platform in IT business process on the basis of type of organization[3] It is inferred from the obtained t-value there is a significant difference in respondent's level of test management platform in IT business process on the basis of type of organization. Since the calculated t-value (3.62) which is significant at 0.01 level. Therefore the stated null hypothesis is rejected and alternate hypothesis is accepted. Therefore it is concluded that respondents differ in their level of test management platform in IT business process on the basis of type of organization. Medium respondents have better attitude about test management platform in IT business process. The details of Mean, S.D. and t-value for respondents level of challenges for best software infrastructure management in IT business process on the basis of type of organization[4]. It is inferred from the obtained t-value there is a significant difference in respondents level of challenges for best software infrastructure management in IT business process on the basis of type of organization. Since the calculated t-value (3.60) which is significant at 0.01 level. Therefore the stated null hypothesis is rejected and alternate hypothesis is accepted. Therefore it is concluded that respondents differ in their level of challenges for best software

infrastructure management in IT business process on the basis of type of organization. Medium respondents have better opinion about challenges for best Software infrastructure management in IT business process. The details of Mean, S.D. and t-value for respondent's level of attitude about challenges for best software production support management in IT business process on the basis of type of organization[5]. It is inferred from the obtained t-value there is a significant difference in respondent's level of attitude about challenges for best software production support management in IT business process on the basis of type of organization. Since the calculated t-value (2.14) which is significant at 0.01 level. Therefore the stated null hypothesis is rejected and alternate hypothesis is accepted. Therefore it is concluded that respondents differ in their level of attitude about challenges for best software production support management in IT business process on the basis of type of organization. Medium respondents have better attitude about challenges for best Software production support management in IT business process. The details of Mean, S.D. and t-value for respondent's level of attitude about challenges for best software development management in IT business process on the basis of type of organization[6]. It is inferred from the obtained t-value there is a significant difference in respondent's level of attitude about challenges for best software development management in IT business process on the basis of type of organization. Since the calculated t-value (3.48) which is significant at 0.01 level. Therefore the stated null hypothesis is rejected and alternate hypothesis is accepted. Therefore it is concluded that respondents differ in their level of attitude about challenges for best software development management in IT business process on the basis of type of organization. Medium group have high level of attitude about challenges for best Software development management in IT business process.

Table: 1 Correlations between demographic variables and assessment of strategies for business process improvement

Demographic variable	Best test management platform in IT business process	Best software infrastructure management in IT business process	Best software production support management in IT business process	Best software development management in IT business process
Type of organization	0.43**	0.52**	0.47**	0.61**
Experience	0.49**	0.61**	0.62**	0.58**

****significant at 1 % level.**

Correlation between demographic variables and assessment of strategies for business process improvement. Result indicate that there is a positive and significant relationship between Type of organization and Best test management platform in IT business process 0.43, Best software infrastructure management in IT business process 0.52, Best software production support management in IT business process 0.47, Best software development management in IT business process 0.61. Also experience is a positive and significant relationship between Best test management platforms in IT business process 0.49, Best software infrastructure management in IT business process 0.61, Best software production support management in IT business process 0.62, Best software development management in IT business process 0.58. Therefore it is concluded that there is a positive correlation between demographic variables and assessment of strategies for business process improvement.

Table: 2 Regression analysis for demographic variable and software development management in IT business process

R	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**Change Statistics**				
				R Square Change	**F Change**	**df1**	**df2**	**Sig. F Change**
0.64	**0.89**	**0.72**	**0.031**	**0.89**	**36.154**	**6**	**145**	**.002**

a Predictors: (Constant), age, gender, designation, type of organization, experience.

Table: 3 ANOVA

	Sum of Squares	Mean Square	F	Sig.
Regression	440674.491	88134.898	124.34	0.001
Residual	124.152	0.214		

a Predictors: (Constant), age, gender, designation, type of organization, experience.

b Dependent Variable: software development management in IT business process.

Table: 4 Coefficients of Age, gender, type of organization and experience

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	85.948	9.035	0	9.513	.001*
Age	.591	.048	.516	12.263	.001*
Gender	.171	.050	.145	3.381	.001*
Designation	3.088E-02	.024	.051	1.290	0.198
Type of organization	2.000	.000	.386	3786.25	.000*
Experience	1.000	.000	.255	3032.802	.000*

a Dependent Variable: software development management in IT business process.

The above table shows Regression analysis for demographic variable and software development management in IT business process. In the analysis obtained r-square value is 0.89. So the demographic variable influenced 89% about software development management in IT business process. The calculated F-value 124.34 is also significant p=0.001. Based on the coefficient table Age, gender, type of organization and experience are the predicting factor to determined the software development management in IT business process.

FINDING

Analysis display that the obtained t-value there is a significant difference in respondent's level of test management platform in IT business process on the basis of type of organization. Medium respondents have better attitude about test management platform in IT business process. Result indicate that there is a positive and significant relationship between Type of organization and Best test management platform in IT business process 0.43, Best software infrastructure management in IT business process 0.52, Best software production support management in IT business process 0.47, Best software development management in IT business process 0.61. Also experience is a positive and significant relationship between Best test management platforms in IT business process 0.49, Best software infrastructure management in IT business process 0.61, Best software production support management in IT business process 0.62, Best software development management in IT business process 0.58.

SUGGESTIONS

The following suggestions are yielded from the research findings to improve the business process in IT industries. Skilled resources are to be recruited and they should be trained in different techniques and various latest test process. Through that the efficiency of business process is improved. Further latest technology may also

help to improve the business process in IT industries software infrastructure and proper environment also to be improved, this will enhance the business process.

CONCLUSION

The present study aimed to identify the assessment of strategies for business process improvement with reference to IT industry in Chennai, Tamilnadu. 625 samples were selected on the basis of random sampling method. The researcher framed some objectives and hypotheses. After framing the objectives, questionnaire was prepared by the researcher. Using standard questionnaire, data were collected from the respondents. After collecting the data, they were coded using Microsoft excel. The data were analysed using standard statistical package called SPSS (Statistical Package for Social Science). Statistical tools such as One-way ANOVA, t-test, correlation, regression and chi square test were applied. The result concluded that respondents significantly differ in their perception about the assessment of strategies for business process improvement in IT industries based on demographic variables.

Ethical Clearance- Taken from my working industry.

Source of Funding- Self

Conflict of Interest – organisation with working emplyee.

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Tenggeng Dance Case as a Free Sex Media in Lani People Culture and its Impact on the Transmission of Sexually Transmitted Diseases and HIV / AIDS

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ABSTRACT

Background; This article was written based on the results of research by the author in 1997, 2009 and 2015 on *Tenggeng Dance* and sexual behavior of Lani people do with epidemiology of sexually transmitted diseases (STDs) and HIV - AIDS.

Materials and Method: This study used a qualitative approach to data collection techniques of observation, interview and heritage studies.

Results: The result that was found is the implementation of the initial *Tenggeng Dance* performed at the funeral ceremony which aims to balance the grief experienced by the relatives left behind by the deceased. However, the current implementation of *Tenggeng Dance* is a medium used by young people to find a partner dance that ends with a free sexual intercourse.

Conclusion: it is concluded that the high number of cases of HIV - AIDS in the city of Wamena - Jayawijaya district is one result of the occurrence of free sex and changing sexual partners when the *Tenggeng Dance* was held.

Keywords: *Dance Tenggeng, the Lani Peri sexual behavior and HIV-AIDS*

INTRODUCTION

Every artistic activity in a society cannot be separated from other cultural elements, which among other things: the religious system, livelihood systems, social organization, language and other cultural elements. In general, traditional ceremony held in the circle of life (life cycle rites) of a community group is always accompanied with art activities (dance, music / instruments, vocal, literary and other). In a traditional ceremony of course, art is more dominant because of the operations of the art of giving meaning symbol which is the focus of a religious system that was followed.

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METHOD

In the culture of the Papua people, particularly Lani tribe in the Papua hinterland, it has one type of dance they call *Tenggeng Dance* . *Tenggeng Dance 1* is a traditional dance that is often done when there is people die, the time is when the family and relatives mourning. *Tenggeng Dance* activity is usually done in *Honai* that is located around *Honai* where the bodies of the dead was buried. The dancers perform the dance movements in a sitting position facing pairs and between men and women. The ceremony is the purpose, among others: funerals, marriage ceremonies, ritual cleansing kaneke / kanekehagasin (sacred stone) and others. In those ceremonies they perform activities such as breeding swine, singing and dancing. One of the dance performed funerals is *Tenggeng Dance* (dance exchange rings). The following is the description of how *Tenggeng Dance*

performed as one of the funerals activities.

RESULTS AND DISCUSSION

Results of the research by Lola Wagner and Danny I. Orphans in Batam (1997) found that the spreads and the increasing of Sexually Transmitted Diseases (STDs) and HIV / AIDS are (1) a person's sexual experience by alternating couple, (2) community tolerance for frequent change of partner before and after mating, and the lack of use of condoms during sexual intercourse. In Papua such case is strengthened by the growing number of HIV / AIDS in Papua in 1997 there were 122 cases, five years later (2002) HIV and AIDS cases in Papua increased to 1263 cases. Lodging in Wamena Jayawijaya district - the hinterland of Papua in 2002 there were eight cases of HIV / AIDS, and in 2009 according to a report from the Foundation for the Development of Public Health (YPKM) Papua there are 615 people affected by HIV / AIDS, while the report from the Clinic Calvary, there were 1,000 people affected HIV -AIDS. 2014 report from Papua Provincial Health Office of HIV-AIDS cases in Papua province amounted to 19 202 cases and 1491 dead cases . While specific in Jayawijaya district amounted to 2210 cases and 160 dead cases [1]. The latest data in 2015 that is the result of interviews with Second Assistant Jayawijaya district conveyed through the newspaper that the 5100 case. More frightening conditions, namely the medical field who was interviewed while doing the research, said that "now (2015) nearly every week somebody dies because of illness of HIV / AIDS[2]".

However, behaviors that support the spread of sexually transmitted diseases (STDs) in this deadly persists everywhere. In order to combat sexually transmitted diseases HIV / AIDS, the government and institutions - non-governmental organizations (private) good incentive to do various activities such as counseling, information provision to prevent the transmission and conduct tests for the detection, treatment, and assistance to sufferers [2]. HIV / AIDS countermeasure Programs are available at this time, still more focused only on high-risk groups, namely sex workers, prostitutes, transvestites, homosexuals, manager of localization, use of anesthesia, and othersMainly related activities - cultural activities which strongly support the spread of sexually transmitted diseases and HIV / AIDS [3].

Tenggeng Dance In People Lani Culture

Tenggeng Dance is one of several types of dance belongs to Lani. This dance is held if there are relatives who have died. Then grow until the dance can be held on other activities such as garden at harvest time, the days of church and state RI (seventeen of August). To understand Dance Tenggeng, then the following analysis pointed out two forms, namely: (1) the tradition of dance Tenggeng in the culture of the Lani People (before it got influences from the outside), and (2) *Tenggeng Dance* and sexual relationships free (*Tenggeng Dance* after receiving influences from the outside).

Traditional Dance Culture People Tenggeng In Lani People

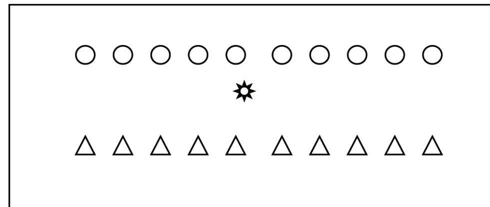
Like what is stated above that the *Tenggeng Dance* is one of a kind of dances of Lani people which is usually done in traditional ceremonies as a media to communicate with supernatural powers, such as ancestral spirits, and the spirits of the recently deceased who called mogat (demons) which they call algolgum.

Tenggeng Dance funeral ceremony; Lani tribe funeral ceremony is always accompanied by several activities, namely: pork cut, burn the bodies, burn stone to cook pork and hipere or bi (sweet potato). There are religious activities, namely: before the body was burned, there was a ceremony in which the relative contribution of grief in the form of hipere / bi (sweet potatoes) and pork. After the bodies were burned, they held *Tenggeng Dance* in the evening.

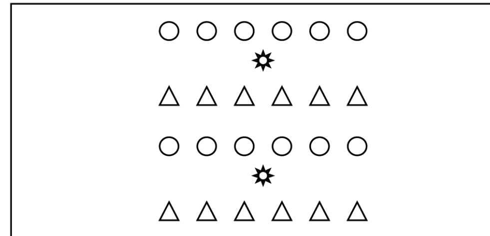
Tenggeng Dance implementation process; *Tenggeng Dance* performed at night so during the day the young couple come to the place / country (silimo) *Honai* people die to know which one will be used for activities in the evening.

This dance is led by someone who used to lead the *Tenggeng Dance* organizing. *Honai* made in the fireplace that can illuminate all the parts in *Honai*. The number of participants dance as much as 10-20 pairs (20-40 dancers) adjusted to the extent *Honai* used for the provision of dance. When the dance is begun, the first opportunity given to the female dancers into the house or *Honai* to take a position one line extending After they (women) are in *Honai*, they are governed by dance leaders to sing songs that is poem that invites the men acquaintances and those not yet known which is beyond *Honai* order to immediately enter into *Honai*.

Composition 1



Composition 2



Composition 1 is formed in one line but Composition 2 is formed in 2 lines.

If they already have a couple of each so they started doing a *Tenggeng Dance* movement (exchange dance bracelet). The dancers are reciprocated RESPONSES convey their feeling. For example, men dancers - sing songs that poem tells the aim to follow the dance proficiency level. Examples of the song as follows:

Yauwiyauwa
Tiboyagu ago
Tabuyagoago
Anggupmban grandmother wongorak
Enggamban grandmother wongorak
Nawilelyinip
Worai catfish yinip
Yauwiyauwa

Meaning: I want to harvest garden courtyard kampong being abandoned. I harvest the leaves, so I offer the women who were willing to dance this Tenggeng declare his love to come with me. If the bid submitted by dancers - men through the song lyric rejected by the female dancers female dancers sing a song with his verse as follows (nyayian rejection):

Yauwiyauwa
Kame Mirik
Kame Gonik
ari hump
kagakari
Gun dealer nenari
Kwapuiqnenari
Yauwiyauwa

Meaning: The men who are being offered or invited me to exchange bracelet, he is rejected because it is known that he was married, and the woman refused his offer.

After the female dancers convey his heart for the first nyayian reply from male - male, then the male dancers - male convey his heart a second time to sing the song as follows:

Yauwi yauwa
Binde nggaruk wonggogurak m›ban
Lale nggaruk wogogurak m›ban
Mire gutah yinip o
Nggoneku yinip o
Yauwi yauwa

Meaning: I ask for honesty and sincerity of your love (the lady who offered to be a couple exchanging bracelet). Because he came to dance Tenggeng is not easy but he passed through the mountains and valleys, but that is a manifestation of his love of the Tenggeng couple. For that, he hopes one certainty of the woman.

(Male - female convey his heart, because he came from another village is a bit far from the location where they held the funeral Tenggeng)

Beside the men who came a little far from home, there are also men in the villages around the village where people have died / mourning answered refusal of the woman said through song lyrics. The man responded with feelings of the heart are upset because he had paid the money door to the mother of the girl who has been

offered or which have been as a couple of bracelet exchange (Tenggeng) which is expected eventually to be husband and wife. However his offer is rejected so he expressed his frustration overthe following song :

Yauwi yauwa
Mbinde morning warogo
Lale morning warogo
Kwuya Pume Pugu kwe
Kwuya Pume Pugu kwe
Mbirimbengendak nggunuk o
Kolari pengendak nggunuk o
Yauwi, yauwa

This means: (a male greeting)

I have given a pig as payment of the door to the mother (her parents). But I do not know that there was a man - another man who asked her to sign. Of course he did not know that.

Dance Motion And Dance Meaning of Symbols In *Tenggeng Dance* ; *Tenggeng Dance* including traditional dance so that it looks very simple, motion rhythm, clothing, makeup and theme. This dance includes a social dance in a dance where the dancers are always looking for a partner as described above. Nevertheless *Tenggeng Dance* has religious value because it is an activity that is always done when there is people die. Pairs of dancers in a squatting position and move his hand forward holding the palm (man or woman) while swapping bracelets [4-6].

The Development of *Tenggeng Dance* And FreeSex.

In The following, it will be informed the changes in the objectives, rationale, events that became a basis for organizing *Tenggeng Dance* , medium of exchange and other elements that undergo transformation, particularly those associated with religious elements. For more details, we need to look along with the changes in the *Tenggeng Dance* as follows [7-8].

CONDITIONS MATRIX OF TEHGGENG DANCE BEFORE AND AFTER THE CHANGING

THE CONDITION BEFORE THE CHANGING	THE CONDITION AFTER THE CHANGING
Tenggeng Dance held only when people die. So this activity associated with funerals.	*Tenggeng Dance* can be held at the marriage ceremony, the opening of the new garden and harvest the gardens, church, independence day, / August 17, and any opportunity as long as there is money, dance could be held.
Objective of the *Tenggeng Dance* is to balance race grief of the family and friends, which on that occasion the young people are exchanging bracelet and show their feeling for approval between the two people (pairs tenggeng) which will then be endorsed by custom.	Objective of the *Tenggeng Dance* is to seek sexual partners. The objective of seeking a mate is not the main goal.
The reasons in the implementationof *Tenggeng Dance* at night is because fear of blood relatives of those who died.	The reasons of *Tenggeng Dance* held in the evenings is to avoid reprimand from parents who do not agree or in the church (pastors, evangelists, pastors) and also to hide from the prying the security forces (police)
Dance Support is just singing without music instrument, so there is no leader of the musicians.	Dance Support is the music using a music instrument and musicians, there is leader who set the course of the dance.
A medium of exchanging used for dancing is the bracelet. Bracelets made from wood fibers or wood rope.	A medium of exchanging used for dancing is money, beads, hand bells and other objects are considered to be favored by a friend of her partner.

Usually at the top of the dance, fire dance in *Honai* quenched and paused because each partner dance that is in *Honai* was doing sexual intercourse. Especially in Wamena town, *Tenggeng Dance* is held every week but in general it's done quietly and is not known by the servants of God (evangelists, pastors) and the security forces (police). Why is that? Because *Tenggeng Dance* activity these moments always ended with a sexual intercourse between *Tenggeng Dance* couples freely. It is more dangerous that the dancers could replace their dance partner which will end up also with sexual intercourse [9].

***Tenggeng Dance* As Medium of Transmission Sexually Transmitted Diseases (STDs) and HIV / AIDS**

Sexual intercourse with multiple partners in the organization of *Tenggeng Dance* gives a great chance of being infected with Sexually Transmitted Diseases (STDs) and HIV / AIDS. It thus associated with the development of the number of people living with HIV / AIDS where the town of Wamena in Jayawijaya district – the hinterland of Papua which is a region where the Lani ethnic live, in 2002 there were eight cases of HIV / AIDS, and in 2009 there are 615 people affected by HIV / AIDS, while the report from the CalvaryClinic, there were 1,000 people affected by HIV -AIDS. 2014 report from Papua Provincial Health Office of HIV-AIDS cases in Papua province amounted to 19202 cases and 1491 were dead cases [10-14.]

Risky sexual behavior and change of sexual partners that occur in the administration of *Tenggeng Dance* is potentially against the transmission of Sexually Transmitted Diseases (STDs) and HIV - AIDS. It thus can be seen in the case of the high number of cases of HIV - AIDS in Wamena be 5100 cases. *Tenggeng Dance* so regarded as a medium in which the young people who join the dance gets a chance to find *Tenggeng Dance* partner.

CONCLUSION

In the culture of the people in Papua, including Lani people cannot separate the art from their religion and ceremonies. Initially *Tenggeng Dance* is one kind of dance in the art of Lani people which is recognized culturally, but the presence of the church and the government (the health and safety) is not approved its implementation, the reason is the negativeselement is greater, namely: the freedom to choose a couple of dance that will end with sex.

The entry of new cultural values to the central mountainous region of Papua have an impact on the art of *Tenggeng Dance* so the shift in cultural values which *Tenggeng Dance* is one of the media that lately is really to have a role in the transmission of sexually transmitted diseases (STDs), HIV AIDS.

Ethical Clearance was taken from the Campus committee and the agreement with the interviewed respondents

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Conflict of Interest - None

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The Curative Effect of Ajwa Dates Toward Hyperuricemia Levels in Wistar Rat (Rattus Norvegicus)

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ABSTRACT

Background. Hyperuricemia in Indonesia does not only occur in the elderly but also in younger people.

Objective. This study aims to determine the effect of Ajwa dates on blood uric acid levels in Wistar rats (Rattus norvegicus) and to establish the effective dosage.

Method. The experimental design of this study was pretest - posttest with control group design, using Wistar rats randomized into three experimental groups and a control group. The data was analyzed through paired T-tests, one-way ANOVA, and LCD post hoc tests to show the curative effect of Ajwa dates toward uric acid levels in Wistar rats.

Results. Ajwa dates showed a significant effect toward decreasing blood uric acid levels in the low-dose ($p=0.014 < 0.05$), medium-dose ($p=0.0006 < 0.05$), and high-dose ($p=0.0008 < 0.005$) groups, while the control group showed a significant increase in blood uric acid levels ($p=0.005< 0.05$). The one-way ANOVA test indicated a significant in blood uric acid levels between the groups before administering Ajwa dates ($0.002 < 0.05$) and after administration ($0.000 < 0.05$). The LSD post hoc test showed significant differences between the high-dose group and low-dose group ($0.001 < 0.05$) as well as the high-dose group and the middle-dose group ($0.008 < 0.05$).

Conclusion. The Ajwa date is effective in the reduction of blood uric acid levels in the Wistar rat (Rattus norvegicus). The high dose (equal to nine grain of Ajwa dates) is the most effective dose in decreasing blood uric acid levels.

Keywords: *Curative Effect, Uric Acid, Ajwa Date, Curative, Wistar Rat*

INTRODUCTION

Hyperuricemia is typically known as a degenerative disease that primarily influences aged people. However, due to the modern lifestyle, this disease, which targets joints, has begun to affect people of the productive age (30-50 years old) [1]. In fact, the development of gout over a long period of time can cause morbidity and disability and can have an impact on work productivity and social participation [2-3].

Uric acid is naturally found inside the body in the acid crystal form as the end product of purine metabolism (derivative form of nucleoprotein). At least 1-2% of the entire productive age population in industrialized countries are now affected with gout [4,5] conducted a random survey in the city of Qingdao, China, demonstrating a gout prevalence increase from 3.6 / 1000 in 2002 to 5.3 / 1000 in 2004 [6].

Several studies have revealed highly beneficial effects of the Ajwa date, such as antimicrobial, nephro protective, anti-diabetic, sex hormone modulation, hepato protective, anti-tumor, and anti-inflammatory properties as well as muscle relaxation support during childbirth [7], anti-fatigue properties due to physical load [8], and preventative properties toward increasing blood uric acid levels [9]. The primacy of consuming dates has also been mentioned in the hadith of the Prophet, narrated by Bukhari Muslim, “Whoever eats seven date fruits in the morning, no poison or sorcery shall hurt him that day”.

Therefore, researchers are interested in the curative effect of the Ajwa date toward blood uric acid levels in Wistar rats (Rattus norvegicus). This study used male Wistar rats because the early research data indicated that gout is more common in males as well as there are generally decreased complications due to stress and no complications due to menstrual cycle in males [10].

METHODS AND MATERIALS

This research used a true experimental pretest - posttest control group design to determine the curative effect of the Ajwa date on uric acid levels in Wistar rats. The study used 20 Wistar male rats (Rattus norvegicus), which were randomized into the following three treatment groups: alow-dose group (5 grains of Ajwa dates, equivalent to 26.5 g / 100 ml), a medium-dose group (7 grains of Ajwa dates, equivalent to 37 g / 100 ml), a high-dose group (9 grains Ajwa dates, equivalent to 47.5 g / 100 ml) and a control group (NaCMC). Each group consisted of 5 rats [11-12], with the following inclusion criteria: pure bred, an age of two to three months, a body weight of 180-280 g, and no an atomic abnormalities. The exclusion criteria were as follows: illness or death during the adaptation period of seven days and infection during treatment.

All groups were induced by consuming high-purine foods such as beef liver (25 g / 100 ml NaCMC). The dose of beef liver provided to rats was calculated daily and was administered as 0.1 ml / 10 g of rat's body weight [13]. Uric Acid (UA) Sure Rosche production was used to measure the blood uric acid levels in the Wistar rats.

Table1 of Average Blood Uric Acid Levels in Experimental Animals

Blood Uric Acid Levels	Low Dose (Mean ± SD)	Middle Dose (Mean ± SD)	High Dose(Mean ± SD)	Control (Mean ± SD)
Pre	5.54 ± 0.53	7.56 ± 1.05	11.88 ± 3.91	4.40 ± 1.03
Post	3.84 ± 1.09	4.80 ± 1.82	5.08 ± 1.47	4.54 ± 0.98
% Velocity	-1.70 ± 0.91	-2.76 ± 1.17	-6.80 ± 3.13	0.14 ± 0.05

Note:n = 5
- : decreased levels of uric acid

The rats were first fed for 7 days with standard feed (corn) in a controlled manner and water in an ad libitum manner (adaptation period). On day 8, the level of uric acid was measured and the rats were subsequently fasted for 8 hours. From days 8 to 14, the treatment group and the control group were induced with the high purine food of beef liver. On the day 15, the pre-measurement of blood uric acid levels was conducted, and Ajwa palm was fed to the treatment groups based on the dose groups (low, medium, and high) orally until day 21, with NaCMC fed to the control group. The post-measurement of uric acid levels was conducted on day 22.

The data were analyzed using a paired T-test, a one-way ANOVA, and a post hoc LSD test with P value 0.05.

RESULTS

The Ajwa dates were only given to the treatment group; the high purine food of beef liver was given to the treatment group and the control group.

The average results of blood uric acid levels on animals in the treatment and control groups (see Table 1) showed that blood uric acid levels decreased in all treatment groups while increased in the control group A decrease of 1.70% of blood uric acid levels was observed in low-dose group. A 2.76% decrease was observed in the medium-dose group. A decrease of 6.80% was observed in the high-dose group. The control group showed an increase in uric acid levels by 0.14%. This effect of Ajwa dates toward blood uric acid levels is illustrated in Table 2, which shows that the administration of Ajwa dates has a significant effect on the rate of decline of blood uric acid levels for all the treatment groups as follows: the low-dose group ($p = 0.014 < 0.05$), medium-dose group ($p = 0.006 < 0.05$), and high-dose group ($p = 0.008 < 0.05$). The control group showed a significant escalation rate in uric acid levels ($p = 0.005 < 0.05$). In addition, the results of the one-way ANOVA test also showed significant differences $p=0.000 < 0.05$). in blood uric acid levels between the research groups, both for the conditions before feeding the rats Ajwa dates ($p=0.002 < 0.05$) as well as for the conditions after feeding ($p=0.000 < 0.05$).

Table2. Feeding effect of Ajwa Dates on Blood Uric Acid Levels

Blood Uric Acid Levels	Low Dose (Mean ± SD)	Medium Dose (Mean ± SD)	High Dose(Mean ± SD)	Control (Mean ± SD)	p value#
Pre	5.54 ± 0.53	7.56 ± 1.05	11.88 ± 3.91	4.40 ± 1.03	0.002
Post	3.84 ± 1.09	4.80 ± 1.82	5.08 ± 1.47	4.54 ± 0.98	0.000
p value*	0.014	0.006	0.008	0.005	

Note: n = 5 - = Decreased levels of uric acid
* = Paired T-Test# = One-way ANOVA test

To obtain an effective dose for lowering blood uric acid levels, the data from each group were processed through a post hoc LSD test. These results can be seen in Table 3, demonstrating that the high-dose group is significantly different from the low-dose group ($p = 0.001 < 0.05$) and the medium-dose group ($p = 0.008 < 0.05$).

Table 3. Result Analysis of LSD Post-Hoc Test

Group		Comparative Group	p
Low-Dose	-	Medium-Dose	0.440
Low-Dose	-	High-Dose	0.001*
Medium-Dose	-	Low-Dose	0.440
Medium-Dose	-	High-Dose	0.008*
High-Dose	-	Low-Dose	0.001*
High-Dose	-	Medium-Dose	0.008*

Note: * = significant differences

DISCUSSION

Feeding effect of Ajwa Dates on Blood Uric Acid Levels

The kidney is the main organ mediating the disposal of metabolic waste products that are unnecessary for the body, including uric acid as the final result of nucleic acid metabolism. As much as 75% of the produced uric acid will be excreted via urine, with the remainder being excreted via the gastrointestinal tract. The product (uric acid) must be cleared from the body as fast as the rate of production [14,15]. With optimal renal function, the excretion of uric acid is also improved (normal), so the uric acid can be excreted in the urine efficiently.

In this study, a decrease in uric acid levels occurred in the group that were fed with varying doses of Ajwa dates in contrast to the control group, which showed elevation of uric acid levels. In fact, all treatment and control groups had a mean increase in uric acid levels after feeding the purine rich foods (beef liver). From this research, it was concluded that the administration of Ajwa dates on Wistar rats with high uric acid levels can lower the blood uric acid levels. Lower doses of Ajwa dates caused smaller decreases in the blood uric acid levels in the Wistar rats. Similarly, the higher doses of Ajwa dates causeda greater reduction in the blood uric acid levels. The provision of Ajwa dates at the smallest dose was able to induce a significant decrease in blood uric acid levels.

This study indicates that the Ajwa dates were able to optimize the purine metabolism even though the blood uric acid levels were two fold higher than the baseline uric acid levels. Maintenance of renal health and optimization of purine metabolism allows for decreases in uric acid levels excreted as waste. This is supported by the role of leaf acid in inhibiting the activity of xanthine oxidase [16,11] and superoxide, causing a decrease in uric acid. Xanthine oxidase enzyme catalyzes the reaction between hypoxanthine and guanine with the final product of uric acid [15, 17]. [18]

The synthesis of uric acid from hypoxanthine and xanthine decreased after feeding the rats Ajwa dates. Therefore, the hypoxanthine concentrate and xanthine serum increased, whereas the levels of uric acid decreased. Xanthine and hypoxanthine are more soluble in urine than uric acid and thus are more readily excreted. [9].

As one of the phenol compounds, kafeat acid has been shown to inhibit the effect of the enzyme xanthine

oxidase [19-20]. Kafeat acid has an antioxidant activity 4-6 times stronger against oxidants and free radicals than vitamin C and N-acetyl-cysteine (NAC) [21-23].

Moreover, Ajwa dates have the highest polyphenol content, which is 3541 mg / 100 g [24], a major contributor to antioxidant activity [25-27].

Effective Dose of Ajwa Dates in Lowering Blood Uric Acid Levels

The results of the post hoc LSD test showed that the high-dose group compared with the low- and medium-dose groups showed a significant difference. It indicated that the administration of Ajwa dates has a significant effect on the rate of decrease in blood uric acid levels in all three treatment groups, while the control group showed ~~an~~ a significant increase in uric acid levels. The lower doses of Ajwa dates had less impact toward decreasing blood uric acid levels. The higher dose of Ajwa date had a greater effect on decreasing blood uric acid levels (see Table 1 and Table 2).

This research proves the virtues and benefits of eating Ajwa dates, which are also repeatedly mentioned in the Qur'an in the following sections: Surah Al A'raf verse 55, Al An'am verse 141, Al Anfal verse 58, Al Baqarah verse 190, Az-Zumar verse 53 and Surah Al Maa-idah paragraph 87. God Almighty speaks the truth.

CONCLUSIONS AND SUGGESTIONS

Feeding Ajwa dates provides curative effects toward a decrease in blood uric acid levels in Wistar rats (Rattus norvegicus), and the effective dose is a high dose (equivalent to 9 grains of Ajwa dates).

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The Nationalism Attitute of Dayak in Borders Jagoi Babang Bengkayang District, Indonesia

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ABSTRACT

Moving from the factual condition at the border, this research examines how the nationalist attitude of Jagoy Babang Indonesia border residents, especially Dayak Bidayuh citizens as the nation of Indonesia who always do social relations with neighboring citizens Sarawak Malaysia. This study uses a qualitative approach equipped with descriptive method, data collection using observation techniques and in-depth interviews about Dayak Bidayuh citizens daily activity. The analysis of research data analyzes the attitude of nationalism of border residents in relation to social relations with Malaysians. The results explain geographically Jagoi Babang border region bordered directly with Sarawak state of Malaysia. Historically the social relations of the two citizens are more emotionally tied up in the relationship of kinship in the form of marital blood relationships. This relationship is cemented by the symbiotic relationship of mutualism through the bonding of trade networks between the two countries. Although the social interaction of citizens is closer to Malaysians, but the attitude of nationalism as a nation of Indonesia is still embedded in heart and there is no desire to move Malaysian citizenship. Residents of the border, just want the government's awareness to improve their welfare.

Keywords: *Nationalist attitude, Jagoi Babang Border, Dayak Bidayuh, Nationalism, and symbiotic relationship*

INTRODUCTION

The condition of border communities, in fact, when viewed from the level of welfare in the border region of Indonesia is lower than the Malaysian border population. This creates an economic disparity between the two countries, they are dependent on the citizens of the Sarawak border [1,2]. The dependence of the Indonesian people on one hand has a favorable positive effect, such as buying and selling activities, by selling agricultural produce to neighboring Malaysia, and vice versa in Indonesia on the border of Indonesia to get the basic needs of everyday households from Malaysia. The existence of a mutualist symbiotic relationship as the result of Ubang's research, Martiani explains the border community uses more Malaysian products because they get it easier and cheaper. In addition, border residents can rely on their hope to find employment in neighboring countries. This is explained also by Ishaq [3-5] border between Indonesia and Malaysia to be the foundation to find work, so much migration of border residents to Sarawak.

The intensity and intensity of the Bidayuh Dayak community relationships and the economic disparities of citizens on the border of Jagoi Babang resulted in an orientation towards neighboring Malaysia. The trend of orientation to neighboring Malaysia is a problem when it is associated with nationalism with the assumption that border residents are considered un-nationalist. Based on the explanation of the relationship between the two countries, this study examines the nationalist attitude of the Dayak Bidayuh people at the border of Jagoi Babang in relation to social relations with neighboring Sarawak Malaysia

MATERIAL AND METHOD

This research uses a qualitative deskrptif approach with consideration to indicate the low sense of nationalism of the border community that is directly opposite to neighboring Malaysia. The research target is Bidayuh Dayak citizen who is in border area and always make direct contact with neighboring country of Malayasia. Technique of collecting research data using observation

technique by observing how social relationship of Dayak Bidayuh people at Jagoi Babang border. Data collection techniques are accompanied by in-depth interviews on how social relations between citizens of both countries, and how the nationalist attitude of Bidayuh citizens on the border of Jagoi Babang.

RESULTS AND DISCUSSION

In this discussion explains the social relations of Dayak Bidayuh residents with neighboring state Sarawak Malaysia and how the implications with the attitude of nationalism when making social contact with neighboring countries. Basically, the relational pattern of Dayak Citizens border with Dayak people in neighboring Sarawak Malaysia as ancestral heritage has been done since the first. Although originating from different countries but the relationship remains intertwined. Based on the description, the following is explained first, the picture of Jagoi Babang border is related to population and livelihood.

Geographically Jagoi Babang Border adjacent land with Sarawak Sarawak can pass through the vehicle path can be reached by using four-wheeled vehicles and two wheels, it only takes the distance of approximately one hour to Sarawak Malaysia. Among the paved roads as main routes, there are also footpaths (small roads) for passing people doing farming or gardening activities on foot. They freely went in and out of the country without having to go through immigration checks, as they went through the path of plantation land to sell agricultural produce and plantations.

The livelihoods of the Jagoi Babang border community are mainly in plantations and agriculture, including rubber, cocoa and pepper, vegetables and cultivating farmers. Other livelihoods are craftsmen of various products from rattan, sellers of services such as selling passenger services using two-wheeled vehicles, restaurants, selling retail gasoline, builders and food stalls. The tendency of local residents to sell agricultural products and plantations to buyers from Sarawak, in addition to the closer distance, the selling price is higher than if sold in the area itself and the buyers have been established for so long.

Social-Cultural and Economic Relations of Dayak Residents with Malaysia's Neighboring Countries

The relationship of Dayak Bidayuh residents of Indonesia with Dayak Bidayuh residents in Sarawak Malaysia is closely related to socio-cultural and socio-economic relations at Jagoi Babang border. The characteristics of border residents differ from those of other societies outside the border region of the country, since border residents usually know more about their neighbors than their country. On the basis of geographical proximity, people in border areas often make social contact and visit each other between the two sides. From these visits a close relationship exists, among them there are bound by the bonds of marriage, so that public relations between the two countries there is a bond kinship. The social relations of border residents as described Fariastuti [6,7] People from Sarawak and West Kalimantan cross the border with various intentions, such as business, work, holiday, medical treatment, family visits. The proximityof the two countries' societies as explained Fariastuti and Hassan and Hassan, Mohd Khairul Hisham Malaysia and Indonesia having a similar language and culture. 7.

This proximityis cemented with customs at weddings and ceremonies of death. If one of the family held the event, then this activity involves the citizens of both countries. Based on interviews of a Dayak Bidayuh resident at Jagoy Babang border, explaining that activities related to marriage and death are commonly used by both citizens. As it is known that among them there is a bond of blood, then their involvement because of family relationships. For example, if one Dayak from Indonesia holds a marriage ceremony, Dayak residents from Sarawak Malaysia participate in the marriage ceremony, starting from providing financial assistance or follow the procession of customary marriage, and vice versa. On other occasions, if one Dayak citizen is struck by a death accident, the families of neighboring countries feel grief and attend to participate in the procession of death or other activities involving the families of both countries. This kinship system formed their sense of togetherness [5] and was sealed by Dayak customs that still thick in everyday life.

The proximity of Dayak residents on the border, if related to the attitude of nationalism by understanding the insight of Indonesian nationality, there is a presumption they are more oriented to neighboring Malaysia. Residents of the border on one side of their identity as the people of Indonesia, on the other hand has a relationship of emotional closeness with Malaysians, this is because some of the border residents come from

one clump Dayak Bidayuh, for it more clearly described how the attitude of Dayak nationalism on the border Jagoy Babang .

Attitude of Nationalism of Dayak Bidayuh Residents at Jagoi Babang Border.

Based on several results of the above study can be explained the concept of nationalism is the identity of a person in the form of national identity as a sovereign nation and the desire to defend the State or its territory from threats and interference outside parties. It means that the sense of nationalism of the Tukiran[8] should be kept implanted and defended by the nation's generation. When referring to the attitude of border community nationalism is measured by the level of welfare that makes them love their homeland, and (McDonagh, Philip and O'Reilly, Maureen, [9] where people enjoy living and working in a healthy environment .

Regarding the factors that encourage the emergence of nationalism due to the bonding of the same faction sepananggungan and reside in a same region, but if seen from the condition of poverty can reduce the sense of nationalism border communities distrust of the government that is less attention to border communities, Ishaq [3]. Reinforced by Bahzar, Moh[10] the weakening of nationalism because of the relational relationship marked the decline of confidence, violation of norms and leaders.President of this is about the attitude of nationalism border citizens because orientation more directed to the Malaysian state, but if observed can be said their lives experiencing the situation less favorable mainly due to the low socio-economic conditions that require it to struggle to meet the daily needs of life in neighboring Malaysia.

Here the beginning of the problem with the condition of economic inequality with neighboring countries does require it to survive, dependence with neighboring countries resulted in an inferior position. The conditions of economic dependence and inequality, as explained by Jim and Tesoreo [11], are attributable to inequality at the local level or lower society, leaving them powerless. On that opinion how the citizens of the border can benefit from the dependence through mutual cooperation through trade channels.

Based on the phrase, the true citizens of the border since the independence of the Republic of Indonsia remain in their choice as the nation of Indonesia although they daily interact with Sarawak residents of Malaysia. Precisely citizens of the border feel helped by neighboring countries because they have a business that can provide livelihood or income to his family and not necessarily obtained in his own country Indonesia. Interviews with informants at the Jagoi Babang border show that Dayak people generally have a sense of nationality as the color of the Indonesian state, yet they are aware that the social-economic level of Dayak Malaysians is higher than in Indonesia.

Nationalism Attitude Orientation of Dayak Citizens at Jagoi Babang Borders

The nationalist attitude of Dayak Bidayuh citizens feel as the nation of Indonesia, expressed through the values of nationality inherent in him such as; still recognizes Indonesia as the country where he was born and remains a nation of Indonesia. The subjective dimension of national identity relates to individuals' self-definition as members of the community and the centrality of the nation for this identification (Epstein, Noah Lewin and Levanon, Asaph, 2005: 96). The phenomenon happens because of the lack fulfillment of people's basic need by the government. Certainly the government by Ubang, Martiani, [12] used community leaders to motivate border residents to deepen the sense of nationalism [13].

The nationalist orientation of border residents is seen from their togetherness attitude, hand in hand to solve various problems. How they reject all forms of crime, defend themselves and their environment from the intrusion and persuasion of outsiders who are eyeing Indonesia's natural wealth. The negative accusation of the low nationalist sense of border citizenship needs to be questioned, in fact, border residents function as "social security" to be the foremost guard in maintaining the security of border areas [14-17].

CONCLUSION

Based on the studies that have been described then the conclusions of this study are:

The social relations of the border community of Dayak Bidayuh people are bound by kinship, customs, still cognate. Their proximity is supported by the bonding of large family kinship bound by blood ties and marriage. In the implementation of customary events related to the life cycle carried out with the citizens

and use customary law based on the norms agreed upon them so that customary law has the legality of crossing the border of the two countries. On the other hand the relationship of the two by establishing a trading network using kinship ties and barter system, including cooperation in the field of agriculture and plantation, the cultivation of land with a lease system of mutual benefit between both parties. Form a relationship between citizens of different nationalities without questioning the differences of citizens.

The attitude of border community nationalism (Dayak Bidayuh people) still regard Indonesia as their homeland. For citizens of his border his understanding of nationalism is about the well-being and sense of justice. Conditions of dependence with Malaysian border residents make them can not be separated from the influence with neighboring countries so that the assumption of border residents are not nationalist. In fact the spirit of border community nationalism is still strong. It is proved that there is no desire to turn Malaysian citizens, for him to be the nation of Indonesia is the price of death. The attitude of the nationalism of the border community is seen to defend its territory by certain persuasion. The fact is that the border community serves as a social safeguard to guard against the borders of external threats and disturbances.

Ethical Clearance- Taken from Campus committee and base on the aggrement with the respondent

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Conflict of Interest – None to declare

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Correlation between Calciferol Serum Level and Rhinitis Allergy

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ABSTRACT

Background: Rhinitis allergy is a global health problem and can disrupt the life quality of the patient. Calciferol is an excellent immunomodulator in inhibiting IL-4, IL-5 and IL-13 and will reduce Th_2 differentiation. **Objective:** The objective of this study is to determine the correlation between calciferol serum level and rhinitis allergy symptoms. **Methods**: This study include 40 subjects with cross sectional design to determine the correlation between calciferol serum level and rhinitis allergy symptoms in rhinitis allergy patients based on total nasal symptom score (TNSS). TNSS for very mild = 0-2, mild = 3-6, moderate = 7-9, and severe = 10-12. Statistical analysis was done by using univariate linear regression test and multivariate linear regression test with p<0.05.**Results:** Calciferol serum level has significant correlation with age and rhinitis allergy symptoms based on TNSS which is analysed by univariate linear regression test (p<0.05). The result in multivariate linear regression test suggest a strong correlation between calciferol serum level and rhinitis allergy symptoms based on TNSS (p<0.05). **Conclusion:** Calciferol serum level has significant correlation with rhinitis allergy symptoms based on TNSS. Control of calciferol serum level can be considered as an effort to improve the health of rhinitis allergy patient. Further study that emphasise in controlling calciferol serum level should also consider in controlling rhinitis allergy symptoms.

Keywords: rhinitis allergy, calciferol serum, total nasal symptom score

INTRODUCTION

Rhinitis allergy can happen because of the body's immune system overreaction to allergens. Typical symptoms of rhinitis allergy are serial sneezing, runny nose, nasal congestion and itching in the nose, ear, and palate. The symptoms appear for 2 consecutive days or more with duration more than one hour every day.[1]

Recently, rhinitis allergy is considered as a global health problem because it is a very common disease, approximately 10-50% of population worldwide. The increased prevalence of rhinitis allergy in the last decade is one of the 10 diseases that frequently comes to doctor. Epidemiology data of rhinitis allergy in Indonesia (2002), based on study from several education centres reported that prevalence rate vary from 1.5-12.4% which tends to increase every year. In outpatient unit of Allergy Immunology ENT Wahidin Sudirohusodo Hospital Makassar for 2 years (2004-2006), found 64.4% rhinitis allergy patients from 236 people who underwent skin prick test.[2,3]

Schauber, et al (2008) suggested the correlation between low vitamin D serum level and increased of body's immune system disorder was not a coincidence. Population growth has resulted in people spending more time inside than outside, leading to a lack of sunlight exposure and affect the skin with lower vitamin D or calciferol production [25(OH)D].[4]

Zitterman (2009), reported significant differences in calciferol between summer and winter. Frieri (2011) reported a correlation between allergy events and immune system disorders with low level of calciferol. The study conducted by Arshi (2012), obtained a result with significant difference of calciferol level between

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rhinitis allergy patient in normal population.[4,5]

Calciferol is an excellent immunomodulator. Several recent studies have used vitamin D to treat rhinitis allergy and asthma, however the result is still controversial. Vitamin D deficiency can be treated and will prevent the occurrence of rhinitis allergy, thereby reducing morbidity. Early study had suggested calciferol induced the production of interleukin-4 (IL-4) for Th_2 formation. Further long-term study proved that IL-4 production will be inhibited and thus Th_2 production will decrease.[4,6]

The main target of calciferol is dendritic cells. Calciferol inhibits the maturation of dendritic cells by lowering the expression of CD40, CD80, and CD86 co-stimulator molecule. The production of IL-12 cytokine decrease while the production of interleukin-10 (IL-10) and Treg cells will increase. Decreased production of interleukin-2 (IL-2) and receptor IL-2 expression by T cell due to decreased expression of co-stimulator molecule lead to failure of differentiation and proliferation of T cell.[7,8]

This study objective is to determine the correlation between calciferol serum level and rhinitis allergy symptoms. Calciferol roles in rhinitis allergy also has become clearer and will open an additional therapy for rhinitis allergy by regulating calciferol serum level in the body.

METHOD

The study was done by using cross sectional design to determine the correlation between calciferol serum level with rhinitis allergy symptoms in rhinitis allergy patients.. The study was conducted in Dr. Wahidin Sudirohusodo Hospital Makassar and was held from July 2017 until September 2017. The samples of the study were patients diagnosed with rhinitis allergy in Allergy-Immunology ENT clinic of Dr. Wahidin Sudirohusodo Hospital Makassar and meet the criteria inclusion, such as suffering from rhinitis allergy which is determined from skin prick test and willing to participate in the research..

The variables in this study include the dependent variable, i.e calciferol serum level examined by ELISA and independent variable consist of gender, age, and allergy symptoms measured based on total nasal symptom score (TNSS). The correlation of calciferol serum level with gender, age, and allergy symptoms based on TNSS was analysed by using univariate linear regression test and multivariate linear regression test ($p<0,05$).

This study has received approval from Health Research Ethics Committee of Dr. Wahidin Sudirohusodo Teaching Hospital Makassar. No: 710/H4.8.4.5.31/PP36-KOMETIK/2017. Protocol No: UH17060400.

RESULTS

General characteristics include gender and age. Subjects characteristics description according to gender and age, had proportion of women higher (52,5%) compared to men (47.5%) with the highest number of samples were 45% from 21-30 years old (Table 1). Clinical characteristics based on TNSS, most commonly found in mild case (TNSS : 3-6) are 19% (Table 2).

Table 1. General characteristics of subjects based on gender and age

General Characteristics	N	%
Gender		
Male	19	47,5
Female	21	52,5
Age		
20 –30 years old	18	45,0
31 –40 years old	17	42,5
41 –50 years old	1	2,5
51 –60 years old	4	10,0

Table 2. Clinical characteristics of subjects based on total nasal symptom score (TNSS)

Clinical Characteristics	N	%
Total Nasal Symptom Score (TNSS)		
Very mild	1	2,5
Mild	19	47,5
Moderate	14	35,0
Severe	6	15,0

The correlation of calciferol serum level and gender was seen with linear regression test using Lg 10 for calciferol serum level, so no need to test the normality of data. Univariate linear test result with p value < 0.05 was $p = 0.14$, therefore univariate linear regression test based on this data is not significant or there is no correlation between calciferol serum level with gender. Univariate linear regression test on calciferol serum level with

age, obtained p = 0,026. This proved the correlation of calciferol serum level with age. Along with the increase of age in subject, the calciferol serum level also decreases. In the correlation of calciferol serum level with rhinitis allergy symptoms, p value was <0,001 which showed the significant correlation between calciferol serum level and rhinitis allergy symptoms based on TNSS. These results indicate that calciferol serum level affect rhinitis allergy symptoms based on TNSS (Table 3).

Univariate test results :

Table 3. Correlation between calciferol serum level with rhinitis allergy risk factors based on univariate test

	B (95% CI)	p
Gender	0,043 (-0,015 –0,101)	0,14
Age	- 0,004 (-0,007 –0,000)	0,026
TNSS	- 0,108 (-0,130 –(-0,086))	< 0,001

The result of multivariate linear regression test to see the correlation of calciferol serum level to gender, age, and symptoms of rhinitis allergy with TNSS showed no significant correlation between calciferol serum level with gender and age (p = 0.434 and p = 0.894) and there's a strong correlation between calciferol serum level with rhinitis allergy symptoms based on TNSS (p = 0.00) (Table 4).

Multivariate test results :

Table 4. Correlation between calciferol serum level with rhinitis allergy risk factors based on multivariate test

	B (95% CI)	P
TNSS	- 0.110 (-0.137 –(-0.084))	< 0.001
Age	0.00 (-0,002 –0.002)	0.894
Gender	-0.015 (-0.053 –0.023)	0.434

DISCUSSION

In this study, there is no significant correlation between calciferol serum level and gender. Dusso et al(2005),suggested that men have higher calciferol than women. This is associated with the greater amount of women's fat mass compared to men and also more outdoor activities and exposure to UVB-containing sunlight in male than women, lead to higher calciferol level in men compared with women.[9]

There was a significant correlation in subjects' age distribution between calciferol serum level and age. Where the most participant of the age group is in 20-30 years old. Whereas Dusso *et al* (2005)*,*stated that calciferol level in elderly is lower then youngster. This is due to reduced exposure of UVB accompanied by decreased calciferol synthesis.[9]

The results of linear correlation test showed the higher calciferol serum level significantly is associated with more mild symptoms of rhinitis allergy based on TNSS. The study conducted by Arshi (2012), concluded that there was a significant difference between rhinitis allergy patient and normal population. Frieri (2011) reported a correlation between lower calciferol level with the occurrence of rhinitis allergy, asthma, and atopic dermatitis.[5,10]

The study conducted by Brehm (2009) in people with asthma, concluded a decrease in calciferol level was associated with the increasing of allergy markers. Sandhu (2010) reported that calciferol inhibited the released of inflammation cytokines into the lungs and an increased in IL-10 by Treg and dendritic cells. Searing DA, low level of calciferol associated with the degree of disease and an corticosteroids dosage escalation. Camargo, calciferol admission to pregnant women lower the risk of serial wheezing in children who were followed until 3 years old.[11-13]

Inhibition of dendritic cells by calciferol will increase anti-inflammation cytokine IL-10 production. In vitro study of Penna (2002) obtained a result where IL-10 can keep increasing until 7 folds in dendritic cell which is given calciferol. Increase in IL-10 will induce allergy condition by inhibiting CD28 co-stimulator signal which is in the surface of Th_2 cell. The inhibition decrease cytokine production of IL-4, IL-5 and increase interferongamma(IFNγ) production. IL-10 has an ability as a protection factor, so high level of IL-10 will prevent mast cell degranulation.[7,14]

T regulatory cell(Treg) increases after inhibition of dendritic cell inhibition occurs as the results of increase cytotoxic lymphocyte T antigen-4 (CTLA-4) expression and fork-headboxP3(FoxP3) and induction of IL-10. There's an interaction between CD4 and CD25. Treg cell plays a role in maintaining the balance of body immune system. [7,14-15]

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The Investigation of the Lactic Acid Change among Employee of National Electrical Power Plan

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ABSTRACT

Background and objectives: Work fatigue is a state of decrease capacity and reduced efficiency for work due to several individual factors as well as working environment factors. Factors related to work fatigue among PT PLN (Persero) employee in South, Southeast and West Sulawesi are determined. **Methods and design:** Employees (n=65) were selected using purposive sampling. Age, work posture, lightning, work climate and lactic acid were assessed as work fatigue indicators. The data were analyzed by Chi Square for bivariate analysis and path analysis for multivariate analysis. **Results:**71,4% employees were aged ≥35 years old, 73.3% had a high risk due to poor work posture. Age significantly influence lactic acid before and after work, with t-value respectively 2.310 and 2.252. Age also significantly influence lightning, but only after work with t-value of 2.404 (t statistic >1.96) **Conclusion:** Significant influence between age and lactic acid before and after work and between lightning and lactic acid after work was found by path analysis. It is recommended to apply work shifts for employees over 35 years old and to have a person in charge of controlling lightning at the work environment.

Keywords: *work fatigue, lactic acid, lightning, age, work climate*

INTRODUCTION

Fatigue is an accumulation of various activities of the human body causing tiredness and decreased concentration. Fatigue can also be interpreted as a body protection mechanism to prevent the body from further damage resulting in recovery after resting. Work fatigue can also lead to health problems, both physical and psychological, and causes disruptive performance of the workers [1]. Study shows that from 80% of human error, 50% is caused by work fatigue.

Data from the International Labor Organization (ILO) mentions almost every year, two million workers died due to work accidentcaused by work fatigue factors. The study states that of 58,115 sampled workers, 32.8% or about 18,828 workers suffer from fatigue [2]. Surveys in the USA found that fatigue was a major problem, with 24% of all adults visiting the clinic suffers from chronic fatigue. The same thing is also seen in a study conducted by Kendel in the UK which states that 25% of women and 20% of men complain are always tired [2].

The World Health Organization in the health model made until 2020 foresees a psychological distress in the form of a severe fatigue and leads to depression, will become the second most common killer disease after heart disease. Survey reports in developed countries note that 10-50% of the population experience fatigue due to work. A study by the Ministry of Manpower and Transmigration in Japan of 12,000 companies involving 16,000 workers who were randomly selected, showed that 65% of workers complained of physical fatigue due to routine work, 28% complained of mental fatigue and about 7% of workers complained severe stress and the feel of marginalized [3].

In accordance with its development, there are several ways of measuring fatigue. The current fatigue measurements use "fatigue questionnaire, flicker tension test [4]. There is also a tool to measure muscle fatigue called electromyograph (EMG) that measures muscle contraction. In 2008 human studies (labor) tested biological fatigue using anaerobic energy metabolism

(MEA) lactic acid concentrations. Previously, lactic acid has been found to measure fatigue in animal experiments not for humans [4].

Work fatigue is a variety of circumstances accompanied by decreased efficiency and resilience in work, which can be caused by individual factors and work environment. Therefore, this study aims to see the factors associated with work fatigue on employees of PT PLN (Persero) South, Southeast and West SulawesiRegion.

MATERIALS AND METHOD

Location and research design

This cross-sectional research study was conducted at PT PLN (Persero) in South, Southeast and West Sulawesi region, 10-26 April 2017.

Sample and population

The population were all PT PLN (Persero) employee in South, Southeast and West Sulawesi Region. Samples were enrolled using purposive sampling (n=65) who were willing to take part in the research.

Data collection

Data were obtained primarily and secondarily. The primary data were age, lactic acid and work posture. Lactic acid was drawn from the bloodfrom two measurements (before work at 07.30 am and after work 11.30 am) using Accutrend Plus tool kit. Work posture was obtained by taking the samples picture during work and is calculated by RULA questioner. Secondary data was lightning, which was measured by using lux meter.

Data analysis

Data that were analyzed are univariate, bivariate and multivariate analysis through cross tabulation and path analysis.

RESULTS

Sample characteristic

Table 1 shows univariate analysis, where 27.7%, the highest age group is 50-54 yo. The highest level of lighting in the workspace is 169,0 or 20.0%. Based on the level of lactic acid there are 66.2% of respondents with lactic acid level of 0.5 mmol/ kg.

Table 1 Distribution of Respondents based on Age, Lightning and Lactic Acid

Employee of PT PLN (Persero) South, Southeast and West Sulawesi Region

Characteristic	Total	
	n = 65	%
Age		
20-24	6	9,2
25-29	12	18,5
30-34	4	6,2
35-39	3	4,6
40-44	8	12,3
45-49	7	10,8
50-54	18	27,7
55-59	7	10,8
Lightning		
126,0	6	9,2
130,0	8	12,3
144,0	8	12,3
153,0	12	18,5
157,0	9	13,8
169,0	13	20,0
182,0	4	6,2
187,0	5	7,7
Lactic Acid		
0,5	43	66,2
0,8	2	3,1
0,9	2	3,1
1,0	1	1,5
1,1	3	4,6
1,2	1	1,5
1,3	2	3,1
1,4	3	4,6
1,7	1	1,5
1,8	1	1,5
1,9	2	3,1
2,0	1	1,5
2,3	2	3,1
3,1	1	1,5

Source: Primary Data, 2017

Based on research variables, the distribution of respondents based on work posture shows that there are 58.5% of respondents who have high risk and 41.5% have low risk. Based on the respondent working room temperature variables shows abnormal as much as 6.2%.

Bivariate Analysis

Table 2 shows that 71,4% elderly respondents experienced fatigue while 60.9% young aged did not

experience the same.Meanwhile, for working attitude, data shows that 73.3% are at high risk and experience fatigue and 59.3% are at middle risk and did not experience the same.

Table 2. Cross Tabulation of Independent Variables towards Work Fatigue of PT PLN (Persero) Employee at South, Southeast and West Sulawesi Region

Independent Variable	Work Fatigue			
	Fatigue		Not Fatigue	
	n	%	n	%
Age				
Old	30	71,4	12	28,6
Young	9	39,1	14	60,9
Work Posture				
High Risk	28	73,7	10	15,2
Moderate Risk	11	40,7	16	59,3
Lightning				
Abnormal	34	60,7	22	39,3
Normal	5	55,6	4	44,4
Work Climate/ Temperature				
Abnormal	2	50,0	2	50,0
Normal	37	60,7	24	39,3

***Cont...* Table 2.**

Source: Primary Data, 2017

For lightning, 60.7% respondents with abnormal lightning experienced fatigue and 44.4% with normal lightning did not experience the same. In terms of temperature/work climate, 60.7% respondents with normal climate experienced fatigue, while 50% respondents with normal climate did not experienced fatigue.

Multivariate Analysis

A significant correlation between age and lactic acid concentration in the blood, both, before (2,310) and after work (2,252) could be seen in Figure 1 as a result from path analysis.

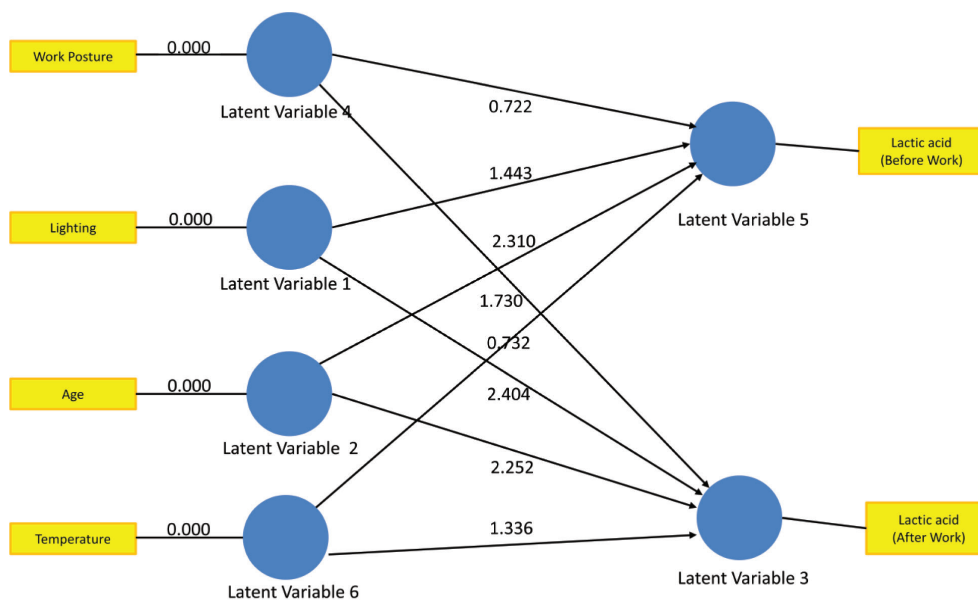

Figure 1. The results path analysis

In addition, lightning also has a correlation with the level of lactic acid in the blood, but the association was found only after doing the work (2,404).

DISCUSSION

This study uses lactic acid measurement as an indicator of the measurement of work fatigue that occurs in employees. Lactic acid test is an objective method for measuring fatigue for both workers and athletes [5]. The accumulation of lactic acid causes muscle pain,which occur after an intense physical activity/exercise. This study believes that the depletion of reserved energy and

the decrease in muscle pH due to accumulation of lactic acid plays a role in muscle fatigue. This may be due to the accumulation of lactic acid inhibits key enzymes in the energy-generating pathway and/or the combined excitation-contraction process [6].

The result of path analysis showed that there was a significant correlation between age and the increase of lactic acid which, as indicator of work fatigue, obtained 2,310 for lactic acid before work and 2,252 after work. Decreased work capacity due to fatigue is caused by a basic phenomenon of aging such as loss of muscle function, decrease of cardiac output, and loss of aerobic capacity. In elderly, muscle tissue will contract and be replaced by connective tissue. Muscle shrinkage causes decreased muscle elasticity. This study is in line with Ihsan & Salami [7] study, which shows the age-related relationship to fatigue in workers at Indonesian auto car company. Similarly, research conducted by Setyowati et al, Mallongi, et al, [8,9] says that work fatigue is affected by the age of the workers.

Sulistioningsih [10], in her research also states that there is a meaningful relationship between age and fatigue, . Phoon explains that age indirectly influences the length of work that determines the duration of exposure to factors causing work fatigue. One indicator of work capacity is muscle strength. Increase in age will indirectly affect the strength of one's muscle which in the end also affects their physical work appearance. Increased age will be followed by VO2 max, visual acuity, hearing rate, decision making, and short-term recall [3].

The result of path analysis on work posture variable in the study did not have significant relationship with the increase of lactic acid (0,722 lactic acid before work and 1,730 for after work). However, in accordance with the results of bivariate tests (Table 2) there are 73.3% of respondents with high risk work posture that experienced fatigue has an increase in lactic acid. It can thus be interpreted that work posture has an indirect relationship with the incidence of work fatigue. Wrong work posture is one of the causes of fatigue that is often not realized, especially in when it has become a habit. Sitting, standing and bending can lead to fatigue, muscle tension thus causes pain;it can also cause irregularity shape of the bones, and spams of the muscles, segments and ligaments [11].

This study is in line with another study done by Polakitan et al [12], which stated that the result of Spearman Rank statistic test obtained p = 0,041, indicating the correlation between work posture with work fatigue at stone worker of Konilow Satu, Tomohon City. Atiqoh et al [13], their research also showed a significant relationship between work posture and work fatigue. A bad or wrong work posture can increase a person's workload, so it can cause various health risks such as acute fatigue, muscle diseases and pain in the lower back. Therefore, from this study it can be concluded that work posture in doing work is essential for a good and safe work performance.

In terms of lightning, result from path analysis shows no correlation between lactic acid before performing the work because the value was 1.443, and there was a significant correlation between lighting and lactic acid in blood after doing the work with 2,404 values. Basically,poor lighting will cause stress on the vision optic, thus requiring more energy to perform their work and leads to work fatigue. Firmansyah [14], in his study also states that there is an influence of lighting with the occurrence of fatigue. Setyowati et al [8], also shows that there is a direct relationship between the physical factors of the working environment in which one of them is intended to be lighting.

According to Guyton (1991), due to high temperatures, the body temperature will increase. This is what stimulates the sweat glands so that the body sweats. Sweat contains a variety of salts, especially Sodium Chloride. The release of this salt along with the sweat will reduce their levels in the body, thus inhibiting the transport of glucose as an energy source. This is what will cause a decrease in muscle contraction so that the body is exhausted. The result of path analysis of room temperature variable in this study found no significant relationship with lactic acid increase, either before work (0,732) and after work (1,336). This is in line with a study conducted by Adi (2013), which states there is no relationship between work climate with the level of work fatigue [15]

This may be due to the number of respondents (only 4 respondents or 6.2%) works in the room with an abnormal temperature, besides that, respondents in this study has a good caution of the importance of rehydration to prevent the occurrence of work fatigue.[16,17]

CONCLUSIONS AND RECOMMENDATIONS

There is a significant association between age and lactic acid in the blood both before and after work, and between lighting and lactic acid in the blood after doing

the work (path analysis). Lactic acid is an indicator of the measurement of work fatigue. Therefore, all employees who are older can maintain health and exercise routine. In addition, the company should also provide guidance on a good work posture, and ergonomics.

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Bacterial and Viral Pathogen Spectra of ARI among the Children Below 5 Years Age Group in Tribal and Coastal Regions of Odisha

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ABSTRACT

Aim-The study evaluates the spectra of viruses, bacteria and mix infection of both pathogens and its drug sensitivity pattern in hospitalized children presenting with Acute Respiratory Infections (ARI) in two geographical settings of Odisha, India.

Materials and method- Nasopharyngeal /Oropharyngial swabs cultured from 1063 ARIs affected children fallowing standard bacteriological culture method & antimicrobial susceptibility using CLSI guidelines and respiratory viruses by multiple reverse transcriptase polymerase chain reaction (RT-PCR).

Results- Out of 1063 specimens 82.2% exhibited seasonal variation and presence of *S. Pneumonia* (31%), *K. pneumaniae* (32%), *S. aureus*, *Streptococcus* spp, *M. pneumoniae*, *P. aeruginosa* and *Moraxilla spp* bacterial pathogens. The viruses detected were *RSV* (12.1%), followed by *HPIV*-1 (5.6%), *Influenza A* (4.6%), and *HMPV* (2.8%). Co-existence of two or more pathogens was found in 116 (10.9%) specimens. Pathogen detection in less than 1- year was significantly higher (P =0.0039). The pathogens isolated in tribal region was significantly higher (52.2%, P<0.0015). Antimicrobial susceptibility indicates the presence of multidrug resistance, extended spectrum betalactamases (ESBL) (75%) and third generation cephalosporin's (87.4%), *MRSA* (16.6%) and Penicillin resistant *S. pneumonia* (84.7%).

Conclusion- The results indicate the need for use of appropriate drug regimens to address ARI in different geographical settings of the state.

***Keywords: -** Infection; Pathogen; ARI*

INTRODUCTION

In developing countries, each year estimated 4 to 5 million children die due to Acute Respiratory Infections (ARI)[1-4]. It is estimated that 40% of the global ARI mortality occurred in south Asian countries like Bangladesh, India, Indonesia, and Nepal. The mortality of children less than 5 years of age was due to ARI is estimated to be 3.9 million annually in developing countries[5, 6]. More importantly, the prevalence of ARI was recorded as high as 25.5% in tribal's, which is the highest reported amongst studies conducted in tribal areas[7]. The state of Odisha is inhabited by 62 tribes and 12 primitive tribes and occupies the second highest percentage of tribal population (22.08%) of India compared to other states. The tribal's residing in remote areas got distinct disadvantages for attaining good health as compared to coastal population of the state because of several apparent features like the high rate of illiteracy, poverty, poor socioeconomic condition, lack of awareness,

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poor communication facilities and suboptimal health infrastructure. The factors causing ARI in the community seems to be complex as several factors like environment, occupation, living conditions contribute largely to its occurrence and progress. Limited systematic studies have been addressed comprehensively to address the pattern of ARI and its major influential factors that might have contributed towards the illness[8]. Etiological agents for lower respiratory tract infection (LRTI) can be a common bacterium, like an intracellular bacterial pathogen, like virus, fungi or parasites. Alpha-hemolytic *streptococci*, *Staphylococcus aureus*, *Moraxella catarrhalis*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae* are the common pathogens followed by *Haemophilus influenzae*, *Mycoplasma pneumoniae* that are opportunistic bacterial pathogens. *Influenza viruses* type *A* and *B*, *Respiratory syncytial virus (RSV), human metapneumoviruses (HMPV), human parainfluenza viruses type 1, 2,* and *3 (HPIV-1, HPIV- 2 and HPIV-3)* are most frequently detected in children with ARIs[11, 12]. Respiratory virus is considered to be a major contributor to acute respiratory infections among the children and it is estimated that almost 60% of ALRIs are associated with ARIs[13]. It has been reported that diagnostic laboratories and clinical microbiologists have a critical role to play in the diagnosis and management of ALRIs[9, 10]. Although there are a large number of pathogens associated with ARI a common clinical pattern is discoverable. So, it is imperative to detect the potential of causative agents to guide appropriate treatment. Inappropriate use of antibiotics not only add to cost, drug resistance. The use of antibiotic can be restricted if viral aetiology is established as seen in many cases. On the other hand the emergence of increased number of multi-drug resistance bacteria contributed abundantly to the ARIs, which is now a global concern. Currently there is paucity of information on the aetiology of causative agents in remote areas, there by inappropriate uses of broad ranges of antibiotics are being used for treatment. Purpose of this study was to identify the spectra of bacterial and viral pathogens isolated from ARIs and its drug sensitivity pattern of pathogens among under-five children in two different hospitals of different geographical settings that can assist to help the health system to make appropriate planning for its containment.

MATERIAL AND METHOD

Study population

The current cross sectional study was undertaken among under five children presenting with ARI admitted to Sardar Vallabhbhai Patel Paediatric Hospital at Cuttack district, and district referral hospital at Rayagada district of Odisha during period from August 2014 to July 2016. The study was approved by institutional ethical committee. A standard format of questionnaire was filled up with details of their name, address, height, weight and temperature, and demographic data such as age and gender besides detailed clinical examination.

Detection of bacterial pathogens

The bacterial pathogens were then isolated using selective media including MacConkey Agar, Blood Agar with Gentamicin, and Chocolate Agar. After morphology dependent selection, colonies were identified by specific tests where necessary such as, optochin sensitivity and bile solubility for *Streptococcus pneumoniae*, appropriate biochemical tests including TSI (Triple Sugar Iron), Urease, Citrate, Mantitol Motility, Indole and Analytical Profiling Index API1 20E (bioMeArieux, St. Louis, USA) for Enterobacteriaceae like *Klebsiella pneumoniae*. Profiling of antimicrobial susceptibility/resistance was performed by the modified disc diffusion method and the bacterial strains were identified as sensitive or resistant to an antibiotic based on the diameter of inhibition zone interpretative chart, published in Clinical and Laboratory Standard Institute (CLSI) guidelines 2014.

Virus detection

Viral DNA and RNA was extracted from 200µl of VTM medium and eluted in 62 µl AE Buffer by using QIAamp Min Elute Virus Spin Kits (KIAGEN, Hilden, Germany). The complimentary DNA sample was synthesized by using Super Script First-Strand Synthesis System for RT-PCR (Invitrogen, Camarillo, CA). Multiplex RT-PCR was done for detection of respiratory viruses including *Respiratory Syncytial Virus (RSV)*, *influenza A* and B, *human parainfluenza viruses* type 1 to 3 (*HPIV1, HPIV2, HPIV3*) and *human metapneumovirus (HMPV)* using standard methods[14].

Statistical Analysis

Two-tailed chi-square test (two by two tables) was performed to calculate the prevalence of the identified pathogens and co-infection frequencies in different age groups. Fisher's exact test using Graph Pad Prism 5.0 was done for comparison of pathogen frequencies

between coastal and tribal children. Probability values of P<0.05 were considered significant.

RESULTS

Spectrum of bacterial pathogens

Among all 1063 specimens examined, only 624 (59%) were found culture positive of which 323 out of 582 from coastal and 302 from 481 tribal region (Fig-2). The most frequently isolated bacteria were *K. pneumaniae* (36%) followed by *S. pneumoniae* (35.4%), *Staphylococcus aureus* (10.4%), *Streptococcus spp*. (4.4%), *Moraxilla spp* (3.4%) and P. *auroginosa* (4.2%). The pattern of bacterial pathogen isolated from two set up was distinctly different. While gram positive bacteria; *S. pneumoniae* (42.5%), *Staphylococcus aureus* (11.2%) and streptococcus spp (5.6%) were predominant from tribal region, the gram negative bacteria like *K. pneumaniae*, Pauroginosa, Moraxilla spp and Mycoplasama pneumonia were frequently isolated from coastal region (Fig-2). No *H. influenza* was found during the study.

In vitro antibiotic sensitivity patterns

The antibiotic sensitivity patterns of bacterial pathogens were tested against the drugs. The culture result of *S. pneumoniae* isolates exhibited sensitivity to ceftriaxone (89.6%) and cefixime (82.4%). In addition 41.6% & 57.9% *S. pneumonia* showed resistance to first line antibiotics like penicillin and ampicillin. However, lower degree of resistance for *S.pneumoniae* was observed for other antibiotics including erythromycin (44.3%), azithromycin (57%), Amikacin (76.4%) and cotrimoxazole (71%) respectively (Table-1). The antibiotic susceptibility test data of *K. pneumaniae* demonstrated resistance against ceftriaxone (90%), 87% against cefixime (87%), and azithromycin (55%); 28% and 33% resistance frequencies against Gentamicin and ciprofloxacin, respectively. Only carbapenem group of antibiotics including imipenem and meropenem exhibited 100% sensitivity against *K. pneumaniae* and most of the gram negative organisms in vitro (Table- 1). More than 50% of the *K. pneumoniae* isolates showed resistance to both first and second line antibiotics in both the population groups. Antibiotic resistance pattern of *Staphylococcus aureus* showed 90% methicillin resistant *staphylococcus aureus* (MRSA). However MRSA were resistant to methicillin, oxacillin and penicillin 90%, 89% and 78% respectively. Only 90% MRSA strains showed sensitive to vancomycin, but *P. aeruginosa* (n=34) showed more than 60% resistance to antibiotics like azithromycin, ceftriaxone, cefixime, and Ampicillin. Only 4 isolates of *P. aeruginosa* isolated from coastal patients showed resistance to all antibiotics. All gram negative pathogens isolated in this study are effective to the carbapenems like imipenem and meropenem tested for. Moraxilla spp isolated showed 85%, 73%, 65% and 55% resistance to Ampicillin, cefixime, azithromycin and ceftriaxone respectively. The multi-drug resistant bacterial strains *K. pneumaniae* was isolated from coastal (n=11) and tribal area (n=4) were showed resistance to all antibiotics tested (Table-1).

Detection of respiratory viral pathogens

Panels of 7 different respiratory viruses were identified using RT-PCR. About 23.5% of enrolled ARI patients had laboratory confirmed viral infections with either single (53%) or with more viruses that were found as co-infection with bacteria (46.4%). Most frequently detected virus was *RSV* (31.2%), followed by *HPIV1* (21.2%), *InfA* (16.8%), *HMPV* (12%) and *InfB* (8.8%) (Fig-2). Other respiratory viral pathogens that had been detected included *HPIV2* in 19 specimens and *HPIV3* as was seen in 11 samples.

Region specific distribution of major viral and bacterial pathogens in under-5 ARI patients

The distribution patterns of respiratory viral and bacterial pathogens detected in both coastal and tribal patients were presented and compared in Table-2. Higher proportion of specimens with culture positive for bacterial pathogens (62.5%) from tribal region compared to coastal region (55.4%). Among the bacterial pathogens isolated in the study, *S. pneumoniae* (42.5%) was the most common Gram positive bacterial isolated from tribal patients samples. Whereas in coastal patients gram negative bacterial pathogen *K. pneumoniae* was most predominant organism (42%) (Table-2). Out of 250 viral pathogens identified in the study, 148 (59.2%) was from tribal cases.

DISCUSSION

Already known on this topic

A study conducted by Razanajatovo NH *et al* during the session July 2008-June 2009 at Madagascar found that *S. pneumoniae* is a predominant cause of <5

child mortality and despite the vaccination program, it is responsible for at least 18% of severe respiratory episodes and 33% of deaths worldwide[15]. Other studies conducted in Kenya, Zambia, Nepal, and Brazil reported *S. pneumoniae* as the most frequently isolated bacteria and the isolation rate ranged from 15.8±54.8%[16-18]. In this study of bacterial detection, *K. pneumoniae* (36%) predominantly found and other bacteria like *S. aureus* (65/624; 10.4%), *Streptococcus spp*. (28/624; 4.4%), *Moraxilla spp* (20/624; 3.4%) and *P. auroginosa* (34/624; 4.2%). *K. pneumoniae* had been described as the most common cause of lower respiratory tract infection in Jordan and India[19, 20]. Predominantly viral association of respiratory tract infection in children is reported in some aetiology studies[22-23]. In this study, *RSV* (31%) was the commonest virus causing ARI throughout infancy, followed by *RSV, PIV* and *HMPV*. The type of viruses causing ARI varies in different geographical regions[24-26]. In present study, *HMPV* virus was detected in 16 children from coastal and 14 children from tribal, which constitutes 5.2% of total children studied. This is consistent with the detection rate of 4-16% reported in other studies also using similar design[27]. In this study *HPIV* has been detected in 6.9% of the children examined. These findings are similar to these in other studies[28]. The current study simultaneously analyzes the data of other viral pathogens like, *RSV, HMPV*, and *HPIV* type 1, 2 and 3 in the aetiology of acute respiratory diseases among children under 5 years of age at Odisha.

MAIN FINDINGS OF THE STUDY

High frequency of ARI (82%) was associated with either bacteria or virus or as co-infection. Bacterial detection (71%) was significantly more than the viruses (23%). Higher proportions (56%) of pathogen detected belong to age group of 0-12 months compared to higher age group (2-5yrs). Out of specimens tested female predominated in tribal (55.7%) compared to coastal (34.5%) region. High frequency of children with ARI tribal (93%) region had detectable pathogen compared to the children admitted to coastal (72%) region. The clinical presentation of LRTI was the major finding of ARI requiring hospital admission in both the regions. Out of 1063 specimens examined for both viruses and bacteria 624 cases had only detectable bacteria, 175 cases with viruses alone and 116 exhibited presence of both bacteria and viruses. The data for the first time that *K. pneumaniae* and *S. pneumoniae* play an important role as the major bacterial pathogens (71.4%). The proportion of virulent pathogens like penicillin resistant *S. Pneumonia* (42%) in tribal specimens was higher than coastal (28.7%). Overall viruses detection was higher in specimens of tribal children while gram positive bacteria like; *S. pneumoniae* (42.5%), *S. aureus* (11.2%) and streptococcus spp (5.6%) were predominantly isolated from tribal region, the gram negative bacteria like *K. Pneumaniae* (42%), *P. Auroginosa* (3.7%), *Moraxilla spp* (5.2%) and *Mycoplasama pneumonia* (5.2%) were predominant in coastal region. Among viruses most predominant was *RSV* (31%) followed by *HPIV*1, *InfluenzaA* and *HMPV* in both the regions. One of the major challenges found was the high prevalence of antibiotic resistance to bacterial respiratory pathogens. The virulence of bacterial pathogen isolated in both the regions presence of penicillin resistant *S. pneumoniae*, *MRSA* and ceftriaxone resistant *K. pneumoniae*. As per current regimen used by state programme to treat ARI is Co-trimexzole and Amoxciline. While *S. pneumonia* was found sensitive to ceftriaxone as seen in tribal region, *K. pneumoniae* was only found sensitive to Carbapenum groups as seen in coastal specimens. The presence of more virulent pathogens showing resistance to large array of antibiotics in coastal specimens was possibly due to the fact that costal region has improved health infrastructure, adequate supply of drugs in pharmacy, multiple prescription and with better literacy awareness of population. However people report to local doctors initially without any drug sensitivity approach delivers treatment, more drug resistant strains have emerged in coastal areas as compared tribal region.

LIMITATIONS

Because of inaccessibility to attend hospital in tribal region some of the ARIs might not have been in the study. More so many ARIs reported at OPD and do not admitted.

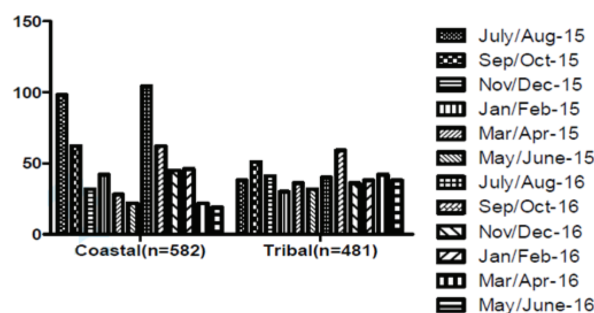

Figure-1, The frequency of specimen collection during the study period

The frequency of specimen collection during the study period. Y-axis indicates the number of specimens, whereas X-axis indicates months of the year

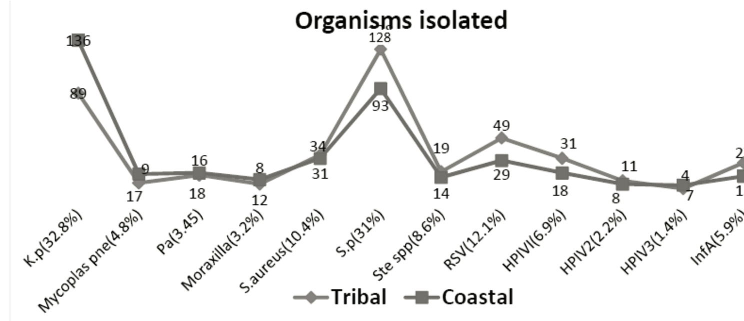

Figure-2, Detection of bacterial and viral pathogens in costal and tribal patients

Kp, Klebsiella pneumonae; Sp, Streptococcus pneumonia; EC, E. Coli; SA, Staphylococcus aureius; SV, Staphylococcus viridian; P, Pseudomonas spp; M, Morexiella spp; IA, Influenza-A; PI1, Para influenza 1; RSV, respiratory syncytial virus; HMPV, human metaneumovirus. Highest number of *KP* followed by *SP* bacterial and PIV1 viral pathogens were found associated with ARI.

Table-1, Resistance pattern of antibiotics of the isolated bacteria

Antibiotics	Streptococcus Pneumoniae N=221	Klebsiella Pneumoniae N=225	Staphylococcus Aureus N=65	P.aeruginosa N=34	Moraxilla spp N=20
Penicilline	92 (41.6%)	-	51 (78%)	-	-
Azithromycin	126 (57%)	126 (56%)	49 (75.3%)	22 (65%)	13 (65%)
Ampicillin	128 (57.9%)	-	51 (78.4%)	25 (73%)	17 (85%)
Erythromycin	98 (44.3%)	-	22 (33.8%)	-	-
Ceftriaxone	23 (10.4%)	196 (87.1%)	26 (40%)	28 (82%)	11 (55%)
Cortimoxazole	156 (70.%)	135 (60%)	23 (35.3%)	16 (47%)	8 (40%)
Cefixime	39 (17.6%)	192 (85.3%)	12 (18.4%)	23 (76%)	25 (73.5%)
Gentamicin	98 (44.3%)	63 (28%)	21 (32.3%)	13 (65%)	18 (52.9%)
Amikacin	169 (76.4%)	163 (72.4%)	22 (33.8%)	6 (17%)	6 (30%)
Vancomycine	56 (25.3%)	212 (94.2%)	12 (18%)	8 (23%)	5 (25%)
Ciprofloxacin	-	76 (33.7%)	49 (75.3%)	6 (17%)	6 (30%)
Imipenem	-	0	-	0	0
Meropenem	-	0	-	0	0
Oxacillin	-	-	58 (89.2%)	-	-
Methicilin	-	-	59 (90%)	-	-

Table-2, Prevalence and comparison of different respiratory pathogens between coastal and tribal patients

Pathogens	Total Specimen	Area		P-value
		Coastal	Tribal	
KP	225	136	89	0.0533
SP	221	93	128	0.00002304
SA	65	31	34	0.2457
PA	34	18	16	0.8286
Moraxilla spp	24	16	8	-
Streptococcus	29	12	17	-
Mycoplasm	26	17	9	-
RSV	78	29	49	0.001306
HPIV-1	53	21	32	0.02481
HPIV-2	18	8	10	-
HPIV-3	11	7	4	-
Inf-A	42	15	27	0.01248
Inf-B	22	8	14	-
HMPV	30	16	14	-

CONCLUSION

The novelty of the study is the detection of sizable proportion of methicillin resistant *s. aureus* and penicillin resistant *s. pneumoniae* that pose significant threat in management of cases of ARI in Odisha. With varied in ethnicity in different geographical region in the state, climate condition, living pattern, appropriate guidelines to address ARIs in the state programme as against the currently used guideline using co-trimoxazole and amoxicillin to address ARI homogenously in all areas of the state.

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Conflict of Interest - Nil

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Covariates and Prevalence of Obesity among the Adults in a Rural Area of Meerut, UP: A Community based Study

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ABSTRACT

Background: Body Mass Index (BMI) has been shown to be an important predictor of risk of non-communicable diseases (NCDs) and associated with risk factors for NCDs.

Aim and Objective: To study the association of BMI and WHR with socio-demographic factors in a rural area of Meerut.

Method: This community based cross sectional study was conducted among rural population aged ≥ 20 years in Parikshitgarh block, Meerut.

Result: In this study according to BMI prevalence of overweight/ obesity was 11.9% while by WHR it was 30.8%.

Conclusion: Obesity has no longer remained a problem of only urban, nuclear family and upper socio economic class but rural Indian belonging to middle class has also dragged into the so called “problem of affluent.

Keywords: *Rural population, BMI, Waist Hip Ratio(WHR), obesity*

INTRODUCTION

In the human history weight gain and fat storage has been viewed as signs of health and prosperity, but recent trend shows a shift in its prevalence from higher to lower socioeconomic level. Obesity can be seen as the first wave of a defined cluster of non communicable diseases called “New World Syndrome” creating an enormous socioeconomic and public health burden in poorer countries. [1] Obesity has reached epidemic proportion in India in the 21st century, with morbid obesity affecting 5% of the country population. [2]. Prevalence of obesity is also rising rapidly in developing countries, including India. [3] Obesity is emerging as a serious problem throughout the world, not only among adults but also children, teenagers and young adults. The etiology of obesity is complex and is one of multiple causation. Like age, sex, genetic factors, physical inactivity, socioeconomic status, eating habits, smoking, alcohol. [4]

Increased predisposition to diabetes & premature CAD in Indians has been attributed to the “Asian Indian Phenotype” characterized by less of generalized obesity measured by Body Mass Index (BMI) & greater central body obesity as shown by greater Waist Circumference (WC) & Waist to Hip Ratio (WHR). [5]

Several studies had been done to suggest appropriate cut out points to define obesity by BMI & WC parameters for Indian population. [6,7] There is thus an increasing interest in investigating other measures such as waist circumference (WC) and waist to hip ratio (WHR) which reflect abdominal adiposity, as predictors of obesity related risks rather than BMI. However, it has been suggested that more studies need to be performed to determine the relationship between BMI, WC and risk of development of co-morbidities to allow for the establishment of validated cut-points. [8].

Rising prevalence of obesity in India may be attributed to the various factors like sedentary life styles, unhealthy food habits, cultural practice and increasing

affluence of middle class people. Prevalence of obesity has increased in few years in rural areas also. The social implication of obesity and overweight is a major problem that is often neglected. [9]

In this context the present study was undertaken to find out prevalence and socio demographic correlates of obesity among rural adults of Meerut District.

MATERIAL AND METHOD

The present community based cross sectional study was conducted in a rural population of Meerut district with the objective to find out prevalence and risk factors of obesity among study subjects.

Study design- community based cross sectional study

Setting-Study was conducted in the area of rural health and training centre (RHTC) Khajuri in Kila Parikshitgarh block which is rural field practice area of department of Community Medicine for providing training to undergraduates and postgraduates.

Study population - All the adults aged ≥ 20 yrs residing in the study area

Total Period of study- March 2011 - September 2011

Inclusion criteria-all the members (male and female) who had completed 20 years of age at the time of data collection and residing in the area for more than 6 months from the selected households were included in the study.

Sample size -Prevalence of obesity in rural areas of India was 15.74%. Using this prevalence and taking permissible error of 4% the required sample size was calculated as 636 after applying design effect.

Sampling technique-Out of five villages around the rural health and training centre Khajuri in Kila Parikshitgarh block two villages were selected randomly. The required sample was taken using systematic random sampling technique.

For gathering the data a personal door to door visit was made to each household. After explaining about the purpose of the study written consent was obtained from head of the family.

During home visit members of the house were listed and eligible persons i.e. aged 20 years and above were interviewed and examined. Those individuals who were not available during first visit were contracted on subsequent visits to that village.

Tools of data collection: a predesigned and pretested interview and examination schedule was used to elicit information about socio demographic factors and other determinants of obesity.

Body Mass Index (Quetlet's index) was defined as weight in kilograms/ (height in meter)^2

Waist circumference was measured at the level halfway between the iliac crest and the costal margin in the mid axillary line after exhaling with the subject in standing position.

Hip circumference was measured at the level of greater trochanters with the subject in standing position and both feet together.

Two consecutive readings was made for each site to the nearest 0.5cm using a non stretchable fiber measuring tape on a horizontal plane without compression of skin. The mean of two set of values was used.

Waist: hip ratio (WHR):

WHR was calculated by dividing waist circumference with hip circumference in centimeter. The cut off used for WHR to define obesity was as follows- [10]

Males > 1 & Females > 0.85

RESULTS

Table No. 1: Socio-demographic Status of respondents

VARIABLES		FREQ	%
AGE (IN YEARS)	<25	179	28.0
	25-40	207	32.3
	40-55	135	21.1
	>55	119	18.6
MARITAL STATUS	Married	493	77.0
	Unmarried	101	15.8
	Widow/widower	45	7.0
	Divorced/ separated	1	0.2

***Cont...* Table No. 1: Socio-demographic Status of respondents**

TYPE OF FAMILY	Nuclear	243	38.0
	Joint	397	62.0
RELIGION	Hindu	382	59.7
	Muslim	258	40.3
EDUCATION	Illiterate	273	42.7
	Up to primary	75	11.7
	Middle	83	13.0
	High School	73	11.4
	Intermediate	60	9.4
	Graduate	55	8.6
	Post graduate	21	3.3
OCCUPATION	Service	31	4.8
	Business	29	4.5
	Professional	5	0.8
	Housewife	304	47.5
	Retired	6	0.9
	Student	45	7.0
	Unemployed	14	2.2
	Labourer	61	9.5
	Skilled worker	36	5.6
	Farmer	109	17.0
SOCIO ECONOMIC STATUS	Upper	8	1.3
	Upper middle	87	13.6
	Middle	220	34.4
	Lower middle	263	41.1
	Lower	62	9.7
TOTAL		640	100.0

In this study about half of the study subjects (50.3%) were below the 40 years of age. Majority of the study subjects were married (77%). Out of all study subjects (62%) of respondents were living in joint family. More than half of (59.7%) study subjects belonged to Hindu religion, rest were Muslims. Among the study subjects maximum (42%) were illiterate while only (11.9%) respondents were educated up to graduate or above. Maximum percentage (47.5%) was of house wives followed by farmers (17%). About half of the study subjects belonged to lower middle or lower class (50.8%).

Table no.2: prevalence of obesity among the study population

Anthropometric indices	**Normal**		**Overweight/ obese**		**P -value**
	No.	%	No.	%	
BMI	564	88.1	76	11.9	<0.001
WHR	443	69.2	197	30.8	

This table shows that prevalence of overweight/ obesity was 11.9% according to BMI while it was much higher (30.8%) according to WHR. This difference was found to be statistically significant.

Table No. 3: assessment of obesity according to BMI and WHR in relation to Socio-demographic profile of respondents

VARIABLES		**OVERWEIGHT**				**P-VALUE**
	BMI		**WHR**			
AGE (in Years)	<25	12	15.8	38	19.3	0.502
	25-40	32	42.1	62	31.5	0.046
	40-55	21	27.6	50	25.4	0.71
	>55	11	14.5	47	23.9	0.089
MARITAL STATUS	Married	66	86.8	163	82.7	0.409
	Un-married	4	5.3	14	7.1	0.591
	Widow/ widower/ separated	6	7.9	20	10.2	0.562
TYPE OF FAMILY	Nuclear	27	35.5	77	39.1	0.583
	Joint	49	64.5	120	60.9	
RELIGION	Hindu	48	63.2	91	46.2	0.012
	Muslim	28	36.8	106	53.8	

This study shows that highest percentage of overweight people was in the age group of 25-40 years by both the parameters but it was significantly higher according to BMI in comparison to WHR.

This study also shows that higher percentage of overweight people were married according to both the parameters as BMI as well as WHR and the difference

in the proportion also was statistically significant.

This study shows that highest percentage of overweight people belonged to joint family according to both the parameters .

This study shows that according to BMI proportion of overweight people was higher among Hindus while according to WHR higher percentage of overweight subjects were Muslim and this difference was also statistically significant.

Table No. 4: Comparison of obesity according to BMI and WHR in relation to Socio-economic profile of respondents

VARIABLES		**OVERWIGHT**				**P-VALUE**
	BMI		**WHR**			
EDUCATION	Illiterate	32	42.1	129	65.5	0
	Up to primary	9	11.8	17	8.6	0.418
	Middle	3	3.9	18	9.1	0.147
	Highschool	8	10.5	11	5.6	0.154
	Intermediate	10	13.2	9	4.6	0.013
	Graduate	9	11.8	10	5.1	0.051
	Post graduate	5	6.6	3	1.5	**0.025**
OCCUPATION	Service	5	6.6	5	2.5	0.105
	Business, professional	5	6.6	5	2.5	0.105
	Housewife	55	72.4	165	83.8	**0.033**
	Student, unemployed, retired	1	1.3	8	4.1	0.247
	Worker	2	2.6	9	4.5	0.471
	Farmer	8	10.5	5	2.5	**0.005**
SOCIO ECONOMIC STATUS	Upper	2	2.6	2	1	0.321
	Upper middle	14	18.4	25	12.7	0.227
	Middle	30	39.5	60	30.5	0.156
	Lower middle	26	34.2	93	47.2	0.052
	Lower	4	5.3	17	8.6	0.359

In relation to education both the parameters show that highest proportion of overweight study subjects were illiterate but difference in proportions was not statistically significant.

In case of occupation obesity was highest among housewives but it was higher according to WHR than BMI and this difference was statistically significant. In farmer obesity was higher according to BMI than WHR and this difference was statistically significant.

This study shows that higher proportion of overweight people belonged to middle and lower middle class by both the parameters.

DISCUSSION

In recent years, evidence is accumulating which suggests that for a given BMI, adiposity can substantially be greater in Asian individuals compared with Caucasian individuals. [11]. In particular, at a similar value of BMI, Asian Indians have significantly greater total abdominal fat and visceral fat area compared with white Caucasians resulting in increased risks of metabolic disorders at much lower levels of BMI. [12]

In our study, prevalence of overweight/obesity was 11.9% according to BMI while it was much higher (30.8%) according to WHR. In a study conducted by Rao CR and Kamat V et al (2011) reported that, prevalence of obesity (BMI> 30) was 6.6% ,over weight (BMI >25) was 21.4% according to WHO BMI classification. [13]

This study shows that highest percentage of overweight people was in the age group of 25-40 years by both the parameters. Similar observation was made by Sunitha Asthana et al (1999) found a direct relationship between age and prevalence of obesity. [14]

.In the present study higher percentage of overweight people were married according to both the parameters. Marital status is related to body weight and obesity in many different ways. People tend to gain weight after entering marriage. Spouses eat the majority of their meals and snacks together both at home and away from home, so that people consume most of their calories with their marital partner. Unmarried people sometimes engage in recreational physical activity to remain thin to attract a desirable partner and also as a form of social activity to interact with other people. According to the National Family Health Survey (NFHS-2), the percentage of ever-married women aged 15-49 years who are overweight or obese increased from 11% in NFHS- 2 to 15% in NFHS-3. [15]

This study shows that BMI proportion of overweight people was higher among Hindus while according to WHR higher percentage of overweight subjects were Muslim. A study done by Ahmad S. et al. (2015) revealed that muslim people do not get proper time to exercise and eat healthy food due to lack of time in their busy schedule. [16]

A study done by Anit Kujur . et al. (2016) revealed that prevalence of obesity was higher among Hindu (47.2%) followed by in Sarna (41.8%) and in Christian (10%). [17]

In relation to education both the parameters BMI as well as WHR show that highest proportion of overweight study subjects were illiterate. Educational status of the subjects seemed to be inversely associated with BMI. Similar findings were reported in study of Pednekar MS et. Al. (2006) in India. [18]

In case of occupation obesity was highest among housewives but it was higher according to WHR than BMI and this difference was statistically significant. In farmer obesity was higher according to BMI than WHR and this difference was statistically significant.

In a study conducted by Rao C R et al (2011) among people having sedentary and light physical activity had BMI ≥30 kg/m kg/m2 respectively. [19]

A higher proportion of literate persons were pre obese /obese as compared to not literate persons. Among the occupational groups, clerical workers and semi-professionals were found to be more underweight as compared to the other two categories; however the differences were not statistically significant. [20]

This study shows that higher proportion of overweight people was belonged middle and lower middle class by both the parameters as BMI as well as WHR The worldwide prevalence of overweight and obesity has been increasing at an alarming rate, indiscriminately affecting populations of both higher and lower middle income countries. [21]

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CONCLUSION

BMI is known to be associated with the development of NCDs.. Hence modification of BMI can impact other risk factors which can in turn reduce the burden of NCDs. Obesity is major health problem in rural India also. BMI is associated with several of these risk factors for NCDs. It is felt that awareness programmes for the control and prevention of NCDs will be beneficial not only in urban but in rural areas also.

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Effectiveness of Tembelekan Plants (*Lantana Camara Linn*) to Aedes Aegypti Larvae Mortality

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ABSTRACT

The incidence of dengue fever in Indonesia is higher that needs precautions and control. Apllicationlarvicides synthetic in the long term could be expected to cause resistance. It required an effort of larvicides alternative, one of them is with natural larvicides derived from plants to toxic insects but harmless to humans and the environment. The objective of this study is to determine effectiveness of roots, stems, leaves and flowerstembelekan (*Lantana camaralinn*) solutionto against *Aedesaegypti* larvae mortality in Mamuju. We did experimental studies to test the effectiveness of roots, stems, leaves and flowers of plants tembelekan (*Lantana Camara Linn*)solution which will be drops in*Aedesaegypti* larvae. This research was conducted at Mamuju Health Polytechnic Laboratory in April-October 2016. Object of this study is *Aedesaegypti* larvae to be tested with roots, stems, leaves and flowers of tembelekan (*Lantana Camara Linn*)solution mixed with water. The results showed that tembelekan plant parts effective to make larvae death are tembelekan roots on 20% – 50% concentration, tembelekan stems on 40% - 50% concentration, and tembelekan leaves on 10& - 50% concentration. While tembelekan flowers ineffective to make larvae death.

Keywords: *Aedesaegypti, tembelekan, solution*

INTRODUCTION

Denguehemoragic fever (DHF) is found in tropical and sub-tropical district. DHF become public health problem in Indonesia over the last 30 years. Number of DHF cases in 2007 has reached 139.695 cases, with the number of new cases (incidence rate) was 64 cases per 100.000 population. Total died cases was 1,395 cases and Case Fatality Rate was 1%.

Cases of DHF2011 in Mamuju district[1] reported 173 cases and only one death. In 2012, DHF cases reported 100 people and one person died. The incidence of cases in Binanga PHCis the highest than five districts. There were 85 cases with 1 died in 2013 and 48 cases with no one died in 2014 [1].

The high incidence of DHF in Indonesia needs precautions and control. Drugs and vaccines to treat DHF disease has not been available until now. The most effective way to prevent DHF disease is “3M Plus” which is closing, draining, stockpiling and doing maintain larvae eater, spreading larvicides, using mosquito nets at bedtime, puting gauze, spraying insecticides, using repellent and installing insect repellent [2].

Research on the effect of leaf extract concentration tembelekan (*Lantana camara L*) as a natural insecticides againstAedesaegypti larvae mortality showed most effective tembelekan extract is concentration of 5 grams at 24 hours observation because it can kill larvae as much as 25 head of 100% [4]. Giving tembelekan leaf extract granules (*Lantana camara L*) can caused Aedesaegypti larvae death by LC50 on the weight of the granules of 379.161 mg and LC99 at 3307.558 mg [5,6].

MATERIALS AND METHOD

This research is experiments to to test the effectiveness of roots, stems, leaves and flowers of plants tembelekan (*Lantana Camara Linn*) solution which will be drops in *Aedesaegypti* larvae. This research

was conducted at Environmental Health Laboratory in PoltekkesKemenkesMamujuin April-October 2016. The objects of this study are aedesaegyptilarvaes instar III and IV as many as 1,200 larvaes. The method used is extraction tembelekan plantto be tested with roots, stems, leaves and flowers of tembelekan (*Lantana Camara Linn*) solution mixed with water to each concentration of 10%, 20%, 30%, 40% and 50%. Larvae inserted into the sample cup that has been filled with the solution of each concentration of 10%, 20%, 30%, 40% and 50% and after 24 hours of treatment it was observed to see the number of dead larvae.

RESULTS

Based on research results conducted at Environmental Health Laboratory in Poltekkes Kemenkes Mamuju by 24 hours observation on roots, stems, leaves and flowers tembelekan (*Lantana Camara Linn*) solution dissolved with each concentration 10%, 20%, 30 %, 40% and 50% in 100 ml of water with various concentrations as follows:

Table 1. Larvae Mortality With Tembelekan Root Solution

Concentration	n	Repetition			Average	%
		I	II	III		
10%	20	9	9	8	8,67	43,35
20%	20	12	12	13	12,33	61,65
30%	20	15	16	16	15,67	78,35
40%	20	19	17	16	17,33	86,65
50%	20	16	18	15	16,33	81,65

Table 2. Larvae Mortality With Tembelekan Stem Solution

Concentration	n	Repetition			Average	%
		I	II	III		
10%	20	1	2	1	1,33	6,65
20%	20	4	2	0	2,00	10
30%	20	2	5	7	4,67	23,35
40%	20	15	19	17	17,00	85
50%	20	20	19	16	18,33	91,5

Table 3. Larvae Mortality With Tembelekan Leaf Solution

Concentration	n	Repetition			Average	%
		I	II	III		
10%	20	14	14	15	14,33	71,65
20%	20	15	15	16	15,33	76,65
30%	20	17	17	15	16,33	81,65
40%	20	17	16	15	16,00	80
50%	20	17	17	17	17,00	85

Table 4. Larvae Mortality With Tembelekan Flower Solution

Concentration	n	Repetition			Average	%
		I	II	III		
10%	20	0	1	0	0,33	0
20%	20	4	3	4	3,67	18,35
30%	20	8	9	12	9,67	48,35
40%	20	2	3	12	5,67	28,35
50%	20	2	7	8	5,67	28,35

Variant Analysis each Plants section

1. Variant Analysis Results of roots, stem and leaf plants using ANOVA Test

Table 5. Variant Analysis of Root, Stem and Leaf Plants by ANOVA

Plant Parts	F	Sig.
Root	33.441	0,000
Stem	54.693	0,000
Leaf	5.167	0,016

Table 5 showed that based on the results of ANOVA test on the part of the plant, the root of the obtained value of p = 0,000 <0,05,that means there is significant difference in mortality of larvae with root solution at 5 type concentrations (F = 33.441). Results of ANOVA test on steam parts is p = 0,000 <0,05,that meansthere is significant difference in mortality of larvae with stem solution at 5 type concentrations (F = 54.693). Results of ANOVA tets on leaf parts is p = 0,016 <0,05that meansthere is significant difference in mortality of larvae with leafsolutionat 5 type concentrations (F = 5.167).

2. Flowers variant analysis results using Kruskal Walis

Table 6: Variant Analysis Section Flowers Plants by KruskalWalis

Plant Part	Df	Asymp. Sig
Flower	2	0,026

Table 6 showed that based on the results of Kruskalwalis test, flowers obtained by value p = 0,026 <0,05 that means there is significant difference in mortality of larvae with interest at 5 type concentration.

Results of Interaction Analysis plant sections with solution concentration

Table 7: Results Interaction Analysis Part Plant with Concentration Juice

Interaction Analysis	F	Sig.
Plant Parts	25.502	0.00
Concentration	8.754	0.00
Plant Parts and Concentration		0.012

Table 7 showed that different parts of the plant that is used as solution showed significant difference to the mortality of larvae with F value = 25.502> 2.839 (p = 0.000). The difference in concentration of the solution showed significant difference in mortality of larvae with F value= 8.754> 2.606 (p = 0.000).The results of interactions analysis between the plant parts and concentration showed that p-value (0.012 <0.05) that means there is an interaction between the concentration and plantparts 5% significance level.

DISCUSSION

Results of laboratory tests on the tembelekan roots solution showed that concentration of 10% can kill larvae on average of 8 larvaes(43.35%), 20% concentration can kill larvae on average 12 larvaes(61.65%), 30% concentration can kill larvae on average of 16 larvaes(78.35%), 40% concentration can kill larvae on average of 17 larvaes(86.65%) and 50% concentrations can kill larvae on average of 16 larvaes(81.65%). So it can be concluded that the higher solution concentration can made the number of larvae will die higher.

Results of laboratory tests on tembelekan stems solution showed that concentration of 10% can kill larvae on average of 1 larvae(6,65%), 20% concentration can kill larvae on average two larvaes(10%), 30% concentration can kill larvae on average 5 larvaes (23.35%), 40% concentration can kill larvae on average 17larvaes(85%) and 50% concentrations can kill larvae on average 18 larvaes(91.5%). So it can be concluded that the higher solution concentration can made the number of larvae will die higher, but there is difference between the number of deaths on high concentration thats are 10% -30% and 40% -50%.

Results of laboratory tests on tembelekan leaves solution showed that concentration of 10% can kill larvae on average of 14 larvaes(71.65%), 20% concentration can kill larvae on average of 15 larvaes(76.65%), 30% concentration can kill larvae on average of 16 larvaes(81.65%), 40% concentration can kill larvae on average of 16 larvaes (80%) and 50% concentrations can kill larvae on average of 17 larvaes (85%). So it can be concluded that the higher solution concentration can made the number of larvae will die higher. Results of laboratory tests ontembelekan flowers solution showed that 10% concentration can kill larvae on average of 0 larvae (0%), 20% concentration can kill larvae on average

of 4 larvaes(18.35%), 30% concentration can kill larvae on average of 10 larvaes(48.35%), 40% concentration can kill larvae on average of 6 larvaes(28.35%) and 50% concentrations can kill larvae on average of 6 larvaes(28.5%). On concentration of 10% there are no larvae were dead and the number of dead larvae were highest at 30% concentration.

Four parts of tembelekan plants are roots, stems, leaves and flowers showed differences in the number of larvae mortality. This showed difference chemical contents compounds in the plant parts which gained the highest percentage of larvae mortality on the leaves and roots and the lowest percentage on the flowers. According Gandjlella research that chemical compounds are toxic what can kill larvae of Aedesaegypti. The chemical compounds presented in the leaves tembelekan are alkaloids, flafanoid, saponin, tannin and essential oils [3,7]. The most effective concentration to kill larvae is 50% concentration for 24 hours with a high percentage of larvae mortality compared with other concentration and the highest on stems with the number of larvae mortality average on 18 larvaes(91.5%). That is because the higher concentration and length of exposure time are given, the higher mortality of Aedesaegyptilarvaes. Aedesaegypti larvae mortality due to the chemical content in tembelekan toxics. Compounds or elements that are toxic even in low concentrations if that into the body of Aedesaegypti larvae will caused chemical reactions in the metabolic process of the body that can caused death [8].

Setiawan research results showed Aedesaegypti larvae mortality on the weight of the granules 30 mg / 100 mL, 50 mg / 100 mL, 100 mg / 100 mL, 200 mg / 100 mL, and 400 mg / 100 mL.Tembelekan leaves extract most kills larvae of Aedesaegypti on the weight of 400 mg / 100 mL granules as many as 14 larvaes(56%)[3]. The difference of research results onAedesaegypti larvae mortality. In that study, the concentration of the most murderous larvae obtained ontembelekan leaves extract concentration of 400 mg / 100 mL of water. Research on the effect of leaves extract concentration tembelekan (*Lantana camara L*) as vegetable insecticides against Aedesaegypti larvae mortality. Thetembelekan leaves extract is most effective on 5 grams with 24 hiurs observation because it can kill larvae as much as 25 larvaes(100%)[4].

Statistical analysis (ANOVA test) showed that on the part of plants, the root of the obtained value of p = 0,000 <0,05, that means there is significant difference in mortality of larvae with root solution at 5 type concentrations (F = 33.441). Results of ANOVA test on steam parts is p = 0,000 <0,05, that means there is significant difference in mortality of larvae with stem solution at 5 type concentrations (F = 54.693). Results of ANOVA tets on leaf parts is p = 0,016 <0,05 that means there is significant difference in mortality of larvae with leafsolutionat 5 type concentrations (F = 5.167). Based on the results ofKruskalWalis test, flowers obtained by value p = 0,026 <0,05 that means there is significant difference in mortality of larvae with interest at 5 type concentration.

Larvae mortality by tembelekan plant parts solution caused by compound contents owned by parts of plants. Tembelekan leaves contained alkaloids, flavonoids, saponins, tannins and quinones. Alkaloid contained intembelekan leaves can stimulate endocrine glands to produced hormones ekdison. Increased hormones can causde failure methamorfosis. Observations on the dead mosquitoes is stuck on pupa that caused failure ekslosi [9]..Dead larvaes showed damage to the digestive tract. This is according to a Shasi and Ashoke's statement that saponins can reduce the surface tension straktusdigestivusd mucosal larvae thus becomes corrosive. In this study showed that some fourth instar larvae turn into pupae and still alive because it is not affected by thetembelekan solution [10,11]. Pupa is not affected by saponin because they have the body wall structure consisting of a hard cuticle that saponinscan not penetrate the walls of the pupa [10,12].

Tanins components be defense against insects by blocking the insect to digest food. Tannins can disturb insect to digest food because tannin will bind to proteins in the digestive system of insects required for growth so that the process of protein absorption in the digestive system becomes impaired. Tannins function suppress food intake, growth rate and ability to survive. Tannins, kuonin andsaponins has a bitter taste that can caused inhibition eating mechanism. In addition, the bitter taste also caused larvae do not want to eat so larvae will starving and eventually die. Other chemical compounds contained in tembelekan is flavonoida. The flavonoida given to phenol compounds derived from the word flavones which is the name of one of the largest flavonoids amounts in plant. Flavonoida is what gives color to the flowers and fruits. In addition, flavonoids

that have a bitter taste and used as a protective defense against insects, fungi and herbivores [13].

Tembelekan poisoned due to active ingredient in the form of phenol in these plants and also have in the form of compound TriperpenoidLantadene A. The stench and toxic properties of this plant can be used as an insect repellent material. The leaves and seeds of *Lantana camara* poisoned animals, grass and humans. *Lantana camara* poisoning symptoms appear 2 to 6 hours after eating the leaves and seeds. *Lantana camara* poisoning symptoms are vomiting, headache, trembling, afraid of the light, dilated pupils, slow breathing, decreased of body pH, decreased tendon reflexes, an ardent sleep can even caused death [14,15]

Examination of plant chemical compounds have been carried out. In 1994, RiniAsterina performed to checks flavonoid and verbaskosid of *Lantana camara L* leaves, obtained there are flavonoid compounds in the leaves that are extracted using 95% ethanol. Flavonoid is classified as a flavonol compounds. Using plants as a natural insecticide from the research results are considered potential as one of the alternative methods and in controlling Aedesaegpty population which is evident from the results of tembelekan plant solution researchwithout use of solvents other than water who can kill the larvaes.

CONCLUSION

Roots tembelekan effective to killing Aedesaegyptilarvaeson concentration of 20% - 50%. Tembelekan roots was effective tp killing Aedesaegyptilarvaes on concentration of 40% - 50%. Tembelekan leaves effective to killing Aedes aegypti larvaes on concentration of 10% - 50%. Tembelekan flowers ineffective to killing Aedes aegypti larvaes.

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Relationships between Blood Mercury Levels and SGPT among Communities Exposed to Mercury in Small Scale Gold Mining Village of Indonesia, 2017

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ABSTRACT

Background and objective: Mercury is widely used in the small scale gold mining (artisanal) in Banten Province of Indonesia. The process in the working site potentially may lead to environmental health problem in the Community surround. The presence of increased SGPT enzyme can be used as potential for mercury which triggered *induced hepatotoxic in the community* surround the artisanal. The activities of SGPT in serum enzyme could serve as markers for evaluating the functional status of the liver. This research aimed to assess relationship of mercury in the blood against the levels of SGPT in the community.

Materials and Method: The design of the studies that used is a *cross sectional*. Research conducted in May 2017. By using the criteria of inclusion and exclusion, gained 68 respondents included in the sample of this research.The Data were analyzed by using statistical tests *Logistic Regression*.

Results: Research results can be explained that 77.9% of respondents have blood mercury levels more than 10 µg/l, increased SGPT levels experienced by 25% of respondents. Respondents with blood levels of mercury more than 10 µ g/l have a risk of getting the levels of SGPT 4.5 times greater compared to respondents with blood mercury levels less than 10 µ g/l after the controlled variables age and length of stay

Conclusion: Most of the respondents have a levels of Mercury in the blood above to the normal value which mean have a risks due to the Hg pollutant

***Keywords**: Mercury, SGPT, artisanal gold mining , Hg blood level, and serum enzyme*

INTRODUCTION

Mercury emissions from a gold mine site has been becoming a serious enviromental problem in developing countries[1]. Research in Indonesia revealed that many people who work or live in gold mining areas are very susceptible to organic mercury. Survey by Rianto in 2010, in Wonogiri regency indicated that the average of mercury content in the working blood is 53,5 µg/l [2]. and research conducted Dewanti (2013) 97.56% blood mercury level in the community has exceeded WHO standar with (5-10 µg/l) [3]

Lebaksitu mining is the Artisanal Small-scale Gold Mining (ASGM). Almost all households have their own *gelundung* units in the front yard, backyard, side of house or near fields to process gold ore. Research that has been done in this area is known mercury level in the water, soil, and fish respectively by 0,00392 ppm, 5,709 ppm, and 0,5175 ppm indicate mercury level that has exceeded the threshold and indicate that there has been enviromental pollution caused by Mercury [4]

Mercury has a number of very harmful effects on humans, among others, resulting in disruptions of liver and kidney function, disrupt the enzyme system and synthetics mechanisms [5]. Liver is the main organ in metabolism of mercury. SGPT is a sensitive marker of living damage because this enzyme is the primary source in the liver. Increased SGPT occurs because mercury-free radicals will interfere with protein synthesis and metabolism in the liver causing hepatocellular damage [6]. Dewanti et al [7] conducted a study on level of SGPT in tradisional gold miners in Wonogiri, as many as 17.07% had SGPT values above the normal value [3].This study aims to determine the correlation of mercury in the

blood to SGPT level in the community.

MATERIALS AND METHOD

The research was conducted at Lebaksitu ASGM in the period of May 2017, by applying a cross sectional study method. Respondents in this study were people who lived around Lebaksitu ASGM, with 68 respondents after determined according to the criteria of inclusion and exclusion.

The primary data obtained from interviews of respondents and laboratory test as a results of Hg blood sampling. The blood mercury examination using the US EPA (1997) method was analyzed using *Inductively Coupled Plasma Mass Spectrometry* (ICP-MS) within 14 days. Examination of SGPT by using *UV Visible Spectrophotometer* with *Kinetic-IFCC* (*International Federation Of Clinica Chemstry*) method. The variables studied were age, gender, length of stay, occupation, smoking habits, medichine consumption physical activity.

RESULTS

The average age of respondents is 38.88 years with the youngest age of 20 years and the oldest 80 years. The results of measurements of mercury in the blood obtained as much as 77.9% of respondents have blood mercury level exceeding 10 µg/l with an average of 26.94 µ/l. This indicate that respondents have been exposed to mercury and will have an impact on health. Meassurement of SGPT level obtained 25% of respondents had SGPT level exceeding normal values.

Tabel 1. Correlation of Blood Mercury Level to SGPT level (µg/l)

At the Community at Lebaksitu ASGM 2017

Levels of Mercury In Blood	SGPT Levels				*p.*	OR (CI 95%)
	>34u/l		≤34u/l			
	n	%	n	%		
>10µgr/L	6	40,0	42	79,2	0,177	0,393 (0,115-1,341)
≤10µgr/L	11	20,8	9	60,0		

The result of the analysis between Mercury level in the blood on SGPT level were unrelated (table 1). The average age of respondents who have SGPT level more than 34 u/l is 44 years, Theres no significant correlation between age with level of SGPT .

Analysis of the correlation to respondents characteristic with SGPT level was obtained from the characteristics of gender, ocupation, body mass index, length of stay, physical activity, medichine consumption, smoking habit on SGPT levels unrelated (table 2)

Tabel 2. Correlation of Respondents Characteristic to SGPT level (µg/l)At the Community at Lebaksitu ASGM 2017

Characteristic of Respondents	SGPT Levels				*p.**	OR (CI 95%)
	>34 u/l		≤34 u/l			
	n	%	n	%		
Gender						
Men	3	20,0	12	80,0	0,745	0,696 (0,171-2,838)
Women	14	26,4	39	73,6		
Occupation						
Gold manager	3	20,0	12	80,0	0,745	0,696

Cont... **Tabel 2. Correlation of Respondents Characteristic to SGPT level (μg/l)At the Community at Lebaksitu ASGM 2017**

Not a gold manager	14	26,4	39	73,6		(0,171-2,838)
Body mass index						
>25kg/m²	5	27,8	13	72,2	0,758	1,218 (0,360-4,120)
≤25kg/m²	12	24,0	38	76,0		
Length of stay						
>10 Year	16	28,8	40	71,4	0,269	4,400
≤10 year	1	8,3	11	91,7		(0,524-36,938)
Physical Activity						
Heavy activity	14	25,0	42	75,0	1,000	1,000
Light activity	3	25,0	9	75,0		(0,237-4,220)
Medicine Consuming Habits						
Often	11	25,6	32	74,4	1,000	1,089
Not often	6	24,0	19	76,0		(0,346-3,422)
Smoking habit						
Smoking	4	26,7	11	73,3	1,000	1,119 (0,304-4,123)
Not smoking	13	24,5	40	75,5		

Table 3. Final Model of Correlation Analysis of Blood Mercury Levels with SGPT Levels At the Community at Lebaksitu ASGM 2017

Variable	Coefisien	P Value	OR	95% CI
Blood Mercury	0,971	0,153	0,379	0,100 –1,432
Age	0,873	0,446	2,393	0,254 – 22,625
Length of stay Constants	0,031 -2,420	0,113	1,032	0,993-1,072

There are three variables in the last modeling of multivariate analysis is blood mercury variable age and variable length of stay. After input into the logistic regression equation, the value of OR=4,49. This means that people who have level of mercury in their blood more than 10 μg/l, with age over 44 years and length of stay more than 10 years are predicted to have 4.5 times greater to chance to have SGPT level greater than 34 u/l compared with the community which has mercury. Content in the blood of lesss than 10 μg/l, with age les stan 44 years and length of stay less than 10 years.

DISCUSSION

Correlation of Mercury levels in the blood with levels of SGPT

The increased serum SGPT may be used as a potential enzyme biomarker for mercury induced hepatotoxicosis which ultimately affects general health by altering the function and structure of liver integrity [8].

The result of this study is diffrent from research on the correlation of mercury blood to SGPT levels. In a study conducted on adult population in South Korea, any doubling of elevated blood Mercury levels could increasing levels of SGPT by 1.067 u/L [9]. In Dewanti and colleagues' research there was a correlation between blood mercury levels and SGPT levels in tradisional gold mining workers in Wonogiri.

The results of this study There is not a significant correlation between mercury levels with SGPT levels.

The assumption that can be put forward this case is not mercury exposure that causes the SGPT levels to exceed the normal value. There are other factors such as high consumption of analgesic group medicine.

Gender with levels of SGPT

There is no significant correlation between gender with levels of SGPT. Gender is not a risk factor for the elevated levels of SGPT. Women respondents mostly work as farmer and housewives where the risk of exposure to mercury is smaller than the male respondents who work as gold manager that area at greater risk. The normal value for men's SGPT levels is slightly higher than for women. One of the factors that affect the levels of SGPT in women is the esterogen hormones [10]. In Dewanti's (2009) study 17.07% of tradisional gold miners in Wonogiri where all male sex samples had SGPT levels exceeding normal value.

Occupation with levels of SGPT

There is no significant correlation between occupation and levels of SGPT. Most of respondents is farmer and housewives, which the risk of exposure mercury is smaller compared to male as a gold managers. The type of occupation is one factor that affects Mercury levels in the body. Occupation with direct contact with mercury has a greater chance of accumulation of mercury in the blood than with occupation which is not directly contact with mercury, the longer the occupation in the exposed areas, the greater the accumulation of mercury poisoning in the body. [11]

BMI (body mass index) with levels of SGPT

This study also revealed that there is no significant correlation between BMI with levels of SGPT. BMI more than 25 kg/m2 has risk 1,218 times having a levels of SGPT more than 34u/l. The physical activity of the people in Lebaksitu village is quite heavy duet o the hilly geographical conditions, difficults transportations access, the location of distance agricultural land so that people have to walk to travel to the intended location. Because the physical studies conducted in Lebaksitu village is heavy, it's assumed that most of the respondents are less than 25 kg/m2. Studies conducted in the United States show that transaminase levels have increased significantly in people with high body mass index, large waist circumference.[12]

Physical activity with levels of SGPT

There is no significant correlation between physical activity with levels of SGPT. respondents who performa heavy physical activity have a risk of 1 time to experience elevated levels of SGPT. Most of the respondents in this study have jobs as farmers and gold manager who have side jobs as farmers. High community activity is also influenced by the geographical location of the village Lebaksitu which is hilly area with poor access road and the absenceof public transport, so most of the community activities are usually done on foot with the distance is far enough one of them is when to go to rice field with an average distance of 1-3 hours. Fatigue caused by too much activity will affect the levels of SGPT.

Medicine with levels of SGPT

There is no significant correlation between frequently taking the medicine with levels of SGPT. Respondents who have frequently taken the medicine will have a probability of 1,089 times greater to have SGPT levels greater than 34 u/l compared with those who rarely take the medicine. In the liver medicine will undergo changes in chemical structures catalyzed by enzymes, also called biotransformations. The more consume medicine can increase levels of SGPT [13]. The community have a habit of taking the medicine is quite high, which amounted to 6.32% of the total respondents. The type of the most consumed medicine is an analgetic.

Smoking with levels of SGPT

There is no significant correlation between smoking with levels of SGPT. Respondents who smoked had risk of 1.119 times greater getting SGPT levels greater than 34 u/l compared with non-smokers. Tobacco reses a large number of free radicals in the body. As free radicals increase, they are neutralized by the antioxidant enzyme super-oxide dismutase (SOD). SGPT enzyme will come out of liver cells when liver cells are damaged so that by itself will cause increasing in levels in blood serum. Smoking causes lipid peroxidation that causes damage to normal cell membranes from the liver. Acording to research conducted by Alsalhen and Abdalsalam in 2014, is greatly increased in blood plasma from smokers. Acording to Kurtul and colleagues citied byElameen and Abdarobo, SGPT levels Wet found to be higher in smokers than nonsmokers [14]

The correlation levels of SGPT with variable

Mercury blood, age, and length of stay.

Obtained by disturbing variable that is age and length of stay to blood mercury. The Three variables were incoporated into the logistic regression model equation, the OR score was 4.49, this means that people with blood mercury levels gretaer than 10 µg/l, older than 44 years old and length of stay more than 10 years were predicted to have 4,49 times greater to have SGPT levels greater than 34 µg/l compared ro people with mercury levels less than 10 µg/l 44 years old and less than 10 years of stay. Mercury has accumulative properties so long stay can affect mercury levels in the body. The longer a person lives in the polluted areas of mercury, the higher the mercury content in his body [15-19]. The research results of the Ministry of Enviroment in Wonogiri regency about mercury exposure proves that the duration of work related to Mercury poisoning [17]. However, both variables suggest the prolonged mercury exposure increase mercury levels and affects the decline of health problems in this case is a liver funcition disolder that can be characterized by SGPT ,more than normal value.

CONCLUSION

There are 77.9% of the study subjects had levels of Mercury in the blood above to the normal value. Then, it was found that 25% of study subjects had SGPT levels exceeding normal values. Necessary point of this study revealed that levels of mercury in the respondent blood are correlated to SGPT levels after the controlled by variable age and length of stay.

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Preparation and Antioxidant Activity of Methanol Extract of *Myrmecodiarumphii* Becc

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ABSTRACT

Ant-plant *Myrmecodiarumphii* Becc. usually used as traditional Papuan medicine. In the present paper, we provide for the first time the cytotoxicity and antioxidant potential of *M. rumphii*Becc. This study reported cytotoxic and antioxidant activities of *M. rumphii*Becc. by using maceration method for three times in every 24 hours and evaporated to obtain 77 g reddish brown concentrated. All samples were partitioned or fractionated by dichloromethane, ethyl acetate, and methanol fraction, respectively, to obtain 1 to 7 fraction. Cytotoxicity was determined using *Brine Shrimp Lethality Test (BSLT)* method while the antioxidant activity using 2,2-diphenyl-2-picrylhydrazyl (DPPH) assay. The most active fraction from BSLT test is fraction 7 with LC_{50} is 0,4752 µg/ml. DPPH assay shows that fraction 5 was the most potentials antioxidant with 92,6601% radical scavenging activity. From this result indicated that the local ant-plant (Sarang Semut plant) from Merauke are high potential as a source of antioxidant.

Keywords: *ant-plant; Myrmecodiarumphii Becc.; BSTL method; DPPH assay; antioxidant*

INTRODUCTION

Free radicals, oxygen radicals, and other reactive oxygen species are produced either from normal cell metabolism in situ or from external. Overproduction of free radicals that cannot gradually be destroyed, called oxidative stress, may cause oxidative damage in thehuman body, eventually leading to chronic and degenerative illness such as cancer, autoimmune disorder, aging, cataract, rheumatoid arthritis, cardiovascular and neurodegenerative disease[1-3].

Antioxidants have been considered essential for preventing cell damage by scavenging deleterious free radicals[4]. Antioxidants are very important in health care to prevent and scavenge free radicals and the damage caused by reactive oxygen species; alleviate chronic disease and degenerative ailments such as cancer, autoimmune disorders, hypertension, atherosclerosis; and delay the aging process[56]. Endogenous and exogenous antioxidants are used to neutralize free radicals and protect the body from free radicals by maintainingthe redox balance.[7]

Many plants, vegetables, spices, and herbs contain important natural substances such as antioxidant. Somestudies have done with antioxidant activity to obtain some new sources of natural antioxidants to be used in food, cosmetics, medicine, and other purposes 6.

Several studies about plants from Rubiaceae family showed that this family produced natural substances such as anantioxidant. Ethanol extract of leaves of *Borreriaverticillta* Linn (Rubiaceae) may serve as a promising source of theantioxidant agent as well as being helpful in the treatment of ailments resulting from free radical damage[8]. The methanol extract of *Psychotriagriffithii* and *Hydnophytumformicarum* showed strong DPPH radical scavenging activity with IC_{50} values of 14.0 and 22.4 µg/ml, respectively[9]. Methanol extract of Lady's Bedstraw (*Galiumverum* L., Rubiaceae) herb from two different location in Serbia, Mt. Zlatar and Veternik, expressed very strong scavenger activity, with IC_{50} 0.05 and 0.54 µg/ml, respectively[10]. *Sambucusnigra* flower, leaves, and bark are

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extraordinarily rich in antioxidants and have frequently been used in traditional medicine and healing[11].

*Myrmecodia*and *Hydnophytum* genus, belonging to family Rubiaceae, also known as ant-plant or Sarang Semut plant, is widely used in Papua as aherb with abroad range of therapeutic values, which is used to enhance immunity, treat gout, rheumatic, and tumor.There are 45 species of *Myrmecodia*dan 26 species of *Hydnophytum* which have an association with ants [12]. Several studies have done to obtain their bioactivity. The crude hexane, dichloromethane, ethyl acetate, and methanol extract of *Hydnophytumformicarum* Jack. showed such activities against many Gram-positive and Gram-negative bacteria, antioxidant potency,and had the ability to increase lymphocyte proliferation by increasing concentration [13,14]. Extract of ant-planthasthe capability to inhibit the growth of HeLa and MCM-B2 cells[12]. Plant extract of *Myrmecodiatuberosa* Jack and its fractions revealed the significant potency of this plant as an immunomodulator and may act as co-chemotherapy in Dox use [15]. Papua's *M. pendans*exhibited a high potential antitumor activity in human oral tongue squamous cell carcinoma through induction of p27Kip1 and suppression of cyclin E [16].

Tomer is one of the villages in Merauke, Papua which has different species of ant-plant (Sarang Semut plant) which is often used by local people as traditional medicine. Taxonomy identification shows that this local ant-plant (Sarang Semut plant) was *Myrmecodiarumphii* Becc. To the best of our knowledge, there are no data available on the bioactivity of *M. rumphii* Becc. In this study, we are focusing on the cytotoxicity and antioxidant capacity of *M. rumphii* Becc. using*Brine Shrimp Lethality Test (BSLT)* method and 2,2-diphenyl-2-picrylhydrazyl (DPPH) assay.

MATERIALS AND METHOD

Plant Material

Ant-plantswere collected from Tomer village, Merauke, Papua, the east of Indonesia and identified as *Myrmecodiarumphii*Becc. A voucher specimen was deposited at the Biodiversity Center of Papua University, Papua. Figure 1 shows the morphology of *M. rumphii*Becc. in the study.

Preparation and Partition of Methanol Extract

Hypocotyl tubers of ant-plants were peeled, washed, thinly sliced, dried in the sunshine, and ground to obtain finely powdered sample about 3.36 kg. The sample was macerated in methanol for three times in every 24 h and evaporated using rotary vacuum evaporator to obtain 77 g reddish brown concentrated extract. Samples were partitioned by dichloromethane (DCM), ethyl acetate (EtOAc), and methanol (MeOH) solvent, respectively, using vacuum liquid chromatography. Thin layer chromatography (TLC) test showed the TLC profile of each fraction. Fractions showing the same spot and retention factor (Rf) were merged, so obtained Fraction 1 to 7.

Brine Shrimp Lethality Test (BSLT)

Brine shrimp lethality test was used to predict the cytotoxic activity of MeOH and Fraction 1 to 7 by a method described previously[17]. For the experiment, 1 mg of each extract saw dissolved in 1 ml of dimethylsulfoxide (DMSO) and solutions of varying concentration (1000, 500, 250, 125, 62.5 μg/ml) were obtained by the serial dilution technique using simulated seawater. The solutions were then added to the pre-marked vials containing 10 live brine shrimp nauplii in simulated water. After 24 h, the vials were inspected using a magnifying glass and the number of survived nauplii in each vial was counted. The mortality endpoint of this bioassay was defined as the absence of controlled forward motion during 30 s of observation. From this data, the percent of lethality of the brine shrimp nauplii for each concentration was calculated. An approximate linear correlation was observed when the logarithm of concentration versus percentage of mortality was plotted and the value of $LC_{50}$was calculated using Microsoft Excel 2010 [17].

2,2-diphenyl-2-picrylhydrazyl (DPPH) Assay

Free radical scavenging activity of extracts was determined by a method described previously Bang, T.H., Suhara, H., Doi, K., Ishikawa, H.,Fukami, K.,Parajuli, G.P., Katakura, Y., Yamashita, S., Watanabe, K.,Adhikari, M.K.,Manandhar, H.K., Kondo, R., Shimizu, K. in their study[18]. DPPH radicals have an absorption maximum at 515 nm; upon reduction by anantioxidant, the solution color fades and the reaction progress is easily monitored by a spectrophotometer (UV Vis Thermo Scientific Genesis).Determination procedures were as follow: 6 x 10^{-5} M DPPH solution was prepared by dissolve 0.24 mg DPPH powder in 10 ml MeOH. A methanolic solution of thesample was prepared by dissolve 10 mg samples in

1 ml MeOH. 33.3 µl of the sample solution was mixed with 1 ml DPPH solution; after 20 min incubation for at 37°C, absorbance decrease of the mixture was monitored at 515 nm (A_s). Blank sample with 33.3 µl MeOH in the above DPPH solution was prepared and measured daily at the same wavelength (A_b). The experiment carried out in triplicate. Radical scavenging activity was calculated using the following formula·

$$Inhibition\ rate\ (\%) = \left[\frac{A_b - A_s}{A_b}\right] \times 100 \quad (1)$$

RESULTS AND DISCUSSION

Cytotoxicity

Brine shrimp lethality test was used to determine the cytotoxic activity of MeOH and Fraction 1 to 7.LC_{50} values obtained from brine shrimp lethality test (Table 1) are 0.9868, 6.4679, 43.0450, 47.8253, 80.9516, 163.3445, 81.0581, 0.4841 µg/ml for MeOH extract and 1 to 7 fraction, respectively.

Table 1. The results of cytotoxic activity of MeOH extract and fraction 1 to 7.

Sample	Merged Fraction	LC_{50} (µg/ml)	Regression Equation	R^2
MeOH extract	MeOH extract	0.99	y = 0.1737x + 0.5010	0.9542
Fraction 1	fraction DCM 1	6.47	y = 0.2436x + 0.3025	0.9464
Fraction 2	fraction DCM 2	43.04	y = 0.4357x - 0.2119	0.9223
Fraction 3	fraction DCM 3 to 4	47.83	y = 0.4208x - 0.2068	0.9614
Fraction 4	fraction DCM 5 to 7 and EtOAc 1	80.95	y = 0.5568x - 0.5625	0.9310
Fraction 5	fraction EtOAc 2 to 4	163.34	y = 0.641x - 0.9186	0.9705
Fraction 6	fraction EtOAc 5 to 8	81.06	y = 0.5252x - 0.5025	0.9570
Fraction 7	fraction MeOH 1 to 5	0.48	y = 0.1609x + 0.5507	0.9379

All fractions resulting in LC_{50} less than 1000 µg/ml were considered significantly toxic towards brine shrimp and clearly indicate the presence of the potent bioactive compound. MeOH extract and MeOH fraction are more active than other fractions. MeOH extract of *M. rumphii*Becc. (LC_{50} 0.99 µg/ml) is more active than MeOH extracts of *Alternantherasessilis Linn* (LC_{50} 19.825 µg/ml), *Amaranthus tricolor* (LC_{50} 28.319 µg/ml), *Benincasahispida* (LC_{50} 45.187 µg/ml), *Chenopodium album* (LC_{50} 10.000 µg/ml), *Corchorusolitorius* (LC_{50} 26.254 µg/ml), *Diplaziumesculentum* (LC_{50} 18.561 µg/ml), *Enhydrafluctuans* (LC_{50} 10.522 µg/ml), *Glinusoppositifolius* (LC_{50} 27.650 µg/ml), *Ipomeaaquatica/ Ipomea alba* (LC_{50} 32.668 µg/ml), *Lagenariasiceraria* (LC_{50} 35.835 µg/ml), *Nymphaeanouchalli* (LC_{50} 21.864 µg/ml), *Portulacagrandifolia* (LC_{50} 11.647 µg/ml), *Spinaciaoleracea* (LC_{50} 60.323 µg/ml), *Xantiumindicum* (LC_{50} 8.447 µg/ml) edible vegetables from Bangladesh [19]. Besides, MeOH extract of *M. rumphii*Becc. are more active than MeOH extract of *Dilleniaindica* Linn. bark with LC_{50} 45.32 ± 2.13 µg/ml [20]. All fractions show moderate to potentials cytotoxic activity and could serve for further ethnobotanical and phytochemical research to find the possible relationship between brine shrimp lethality and plant bioactivity.

Antioxidant Activity

Antioxidant activity of the extracts was determined using 2,2-diphenyl-2-picrylhydrazyl(DPPH) assay. The antioxidant capacity (DPPH radical scavenging activity and discoloration) of all fractions of MeOH extract of *M. rumphii*Becc. is presented in Table 2.

Table 2. Discoloration of DPPH solution before and after added sample , absorbance, and antioxidant activity by DPPH scavenging activity (%) of MeOH and Fraction 1 to 7 of *M. rumphii*Becc.

Sample	Discoloration		Absorbance	DPPH Scavenging (%)
	Before [a]	After [b]		
MeOH extract	purple	purple	0,064	90,98
Fraction 1	purple	purple	0,687	3,60
Fraction 2	purple	purple	0,661	7,34
Fraction 3	purple	purple	0,607	14,87
Fraction 4	purple	light yellow	0,617	13,51
Fraction 5	purple	light yellow	0,052	92,66
Fraction 6	purple	light yellow	0,060	91,58
Fraction 7	purple	purple	0,069	90,28

When DPPH reacts with an antioxidant compound, its stable purple color will be changed to a light yellow color of diphenyl-picrylhydrazine. The result shows that MeOH extract and fraction 5 to 7 have antioxidative activity. The highest DPPH scavenging activity is shown by Fraction 5, followed by Fraction 6, MeOH extract, and Fraction 7 with of 91.58, 90.98, and 90.28 %, respectively. Fraction 5 (EtOAc extract) with 92.66% scavenging is more active than EtOAc extract of *Hydnophytumformicarum* Jack. with 83.31% scavenging. Besides that, Fraction 7 (MeOH extract) with 90.28% scavenging is more active than MeOH extract of *Hydnophytumformicarum* Jack., *Origanumsyriacum*, *Zingiber officinal*, and *Thymus syriacus* with 83.31%, 69.25%, 47.42%, and 45.75% scavenging, respectively [13]. DPPH scavenging of methanol extract of other plants compared to *M. rumphii*Becc.

DPPH inhibition of ethanol extract of *Borreriaverticillta* Linn (EEBV), hydroalcoholic extract of *Rheum emodi*Wall.exMeissn (HERE), hydroalcoholic extract of *Sapindusmukorossi*Gaertn. (HESM), standard Ascorbic acid and Gallic acid for 322 µg/ml concentration were calculated by interpolation from the data of concentration and percentage of scavenging. Results show that MeOH extract of *M. rumphii*Becc. (MEMR) is similar to EEBV to scavenge DPPH radicals and more active in scavenging DPPH radicals than HERE and HESM. Compared to standards of antioxidant, MEMR is active enough as DPPH radical scavenger [8,21].

The screening of cytotoxicity and antioxidants derived from natural sources will encourage researchers to identify compounds as suitable antioxidants and antitumor. The cytotoxic activity fractions indicate the presence of potentials bioactive compounds [17]. Natural extracts with proven antioxidant activity are usually composed with their phenolic moiety. The search antioxidant activity should be continued with the phytochemicals and possible substance with a wide range of pharmacological activities [21-23].

CONCLUSION

The most active fraction from BSLT test is fraction 7 with LC_{50} is 0,4752 µg/ml . DPPH assay shows that fraction 5 was the most potentials antioxidant with 92.66% radical scavenging activity. This indicated that the local ant-plant (Sarang Semut plant) from Merauke are high potential as asource of antioxidant and antitumor. Information of this study should be a valuable reference for future studies on antioxidant, antitumor, and others bioactivities of *M. rumphii*Becc.

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Nutrient Contents of Moringa Leaves based on Leaf Age

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ABSTRACT

Moringa leaf, a multi nutrient plant, in West Sulawesi has not been maximally utilized as a nutrientsource. Moringaleaves are useful as a family nutrient source to overcome micronutrient problem. **Objective**: to see the nutrient content differences of moringas leaf parts: bud, young leaf and old leaf. **Method**: true experiment, laboratory analysis by using triplomethod of each nutrient. **Result:** average nutrient of bud, young leaf and old leaf: Protein (gr): 32.03; 28.77; 22.34, Calcium(mg): 465.09; 960.13; 1501.16, phosphorus (mg): 1169.86; 306.59; 384.71, Iron (mg): 9.54; 9.75; 12.43, Zinc (mg): 2.67; 2.29; 1.53. Statistical test by using one way anova, obtained: Fe:old leaf - young leaf, old bud p<0.05, young bud p> 0,05; Ca, Zn, protein, young bud; young old - old bud p <0.05, Phosphorus, old leaf – young leaf p> 0.05. **Conclusion:** The highest content of: protein is in the bud (32.03 gr); Cain the old leaf (1.501 gr); Fe in the old leaf (12.43mg); Posforin the bud leaf (1.17 gr); Zinc in the bud leaf (2.67 mg). There are differences of Fe content between the old leaf and young leaf, and the bud and the old leaf, there is no difference between the bud and young leaf; There are differences in Ca, Zn, protein content between bud and young leaf, bud and old leaf, and young and old leaf, Phosphorus content: No difference between old and youngleaf

Keywords*: Moringa Leaf, Leaf Age, Nutrition*

INTRODUCTION

Stunting child is not caused by heredity, it caused more by the low nutritional intake both since pregnancy or after birth, non-exclussive breastfeeding, low qualityof weaning food and recurrent infectious diseases. The most critical period in stunting prevention begins from the fetus in the womb until the 2-year-old child which called by 'golden period' (the first thousand days of life). Therefore, nutritional improvements are prioritized at the age of first 1,000 days of life which is 270 days during pregnancy and 730 days first baby life after birth.[1-4]

West Sulawesi Province is one of the areas with high nutritional problems, the prevalence of iron nutritional anemia in children under five (28.1%), children 5-12 years old (29%), pregnant women of 37.1%, 13-18 years old and fertile age woman 15-49 years old of 22.7% .5 Vegetables and fruit consumption are very low, generally only 1 - 2 portion per day of 86.4% (Indonesia, 77.9%), population>10 years old who consume fruits 0, 3% (Indonesia, 0.3%), and vegetables 1.2%(Indonesia 1.2%). Child stunting (short/very short in West Sulawesi 22.3 and 25.7, Indonesia (18.0 and 19.2).[5,6]

Moringaoleifera is a plant that has very rich nutrients, several previous researches have been done to analyze the nutrient content of moringa leaf, such as by Zakaria, et al and by Rudianto, et al by taking young leaf (2 stalks below bud up to 9th or 10th stalk) has proven. The researches obtained: protein (28.25%), beta carotene (Pro-Vitamin A) 11.93 mg, Ca (2241.19 mg), Fe (36.91 mg), and Mg (28.03 mg).[7] Advanced reasearch regarding the formulation of supplementary feeding ingredients to underweight children under five, also using moringa young leaf as the primary protein, vitamins, and minerals source.[8, 9]

West Sulawesi, although the Moringaoleifera plant can grow easily and found everywhere, however has not been optimally utilized as a nutrient source.Previously, research has been regarding nutrient content, yet no research regarding nutrient content of moringa leaf specifically by separating between bud, young leaf, and old leaf. Therefore, in this research we will try to examine the nutrient differences contained in parts of moringa leaf: bud, young leaf and old leavf, and the influences of drying methods on the nutrient content of each type of leaf.

This research only take a few nutrients only: Protein, Fe, Ca, Posphor, Zn, due to this nutrient are very closely related to nutrition problem in West Sulawesi at this time, such as stunting in Toddler, pregnant woman anemia, Less 90 tablets intake of pregnant woman, with the hope if Moringa leaves become one of the alternative ingredients to overcome the nutrient problems, the selection of leaf types could be more specific according to the existing problems.

MATERIALS AND METHOD

Types and Research Design

This research is an experimental research of development, with the type of pure experimental research (true experiment). Laboratory analysis with kjeldahl method for protein content analysis, atomic absorption spectrophotometer (AAS) to analyze Ca, Fe, and Zn, and analysis of phosphorus content with UV-VIS spectrophotometer method. The experiments were performed to each nutrient and each leaf group for 3 repetitions (triplo).

Sample preparation procedure

Leaf Selection

Moringa leaves obtained from Mamuju, Majene and Polman areas which separated by their leaf age, ie (1) bud, (2) young leaf, (3) old leaf. The leaves were washed and dried by hanging on a clothesline in the shade, so that the water attached to the leaf dries up. All the leaves are taken on the same tree

Make leaf powder

The dried kelor leaves were placed in a dark plastic container and mashed into a conventional powder using a mortar then filtered using a gauze filter. Samples were stored in a closed container made of dark plastic before analyzing the nutrient content.

During the process, all the tools used were non-metals to avoid bias due to contaminated material from the tools

RESULTS AND DISCUSSION

Research Results

A Reasearch to determine any difference of nutrient content of Moringa leaf in West Sulawesi Province based on leaf age (bud, young leaf and old leaf) took approximately 6 (six) months: sample collection approximately 4 months and laboratory examination approximately 3 month.

Univariate Analysis

Laboratory analysis to determine the nutrient content of each sample was conducted in Health Laboratory Makassar by using different examination method depends on nutrient to be assessed, to determine protein content examination method used is kjeldahl method, for metal element(Ca, Fe and Zn), the examinationmethod usedis atomic absorption spectrophotometer (AAS) and phosphor examination by using spectrophotometer method. The average description of nutrient content in the Moringa leaf based on the method is as follows.

Table 1. Description of Moringa leaf nutrient content based on leaf age in 100 gram of material

Nutrition Type	Leaf age		
	Bud	Young	Old
Protein (gr)	32.03	28.77	22.34
Ca (mg)	465.09	940.13	1501.16
P (mg)	1169.86	306.59	384.71
Fe (mg)	9.54	9.75	12.43
Zn (mg)	2.67	2.29	1.53

The table show the average difference in each leaf group, of 5 types nutrients researched, three (3) types of nutrients (protein, P , and Zn) is highest on the bud leaf group, while (Ca and Fe) on the old leaf. Young leaf of the five type nutrients researched, the average nutrients content is lower than other 2 leaf groups.

Bivariate Analysis

The results of statistical tests as illustrated in the following table.

Table 2. Nutrient Differences Based on NutrientsType And Leaf Age

Nutrients Type	Leaf Type	P*	95% Confidence Interval	
			Lower Bound	Upper Bound
Fe	Bud – Young	0,709	-0.014	0.009
	Bud – Old	0,000	-0.041	-0.017
	Young – Old	0,000	-0.038	-0.015
Ca	Bud – Young	0,000	-6.056	-3.444
	Bud – Old	0,000	-11.667	-9.054
	Young – Old	0,000	-6.916	-4.304
Zn	Bud – Young	0,001	0.002	0.006
	Bud – Old	0,000	0.009	0.013
	Young – Old	0,000	0.006	0.009
Protein	Bud – Young	0,013	0.764	5.763
	Bud – Old	0,000	7.198	12.197
	Young – Old	0,000	3.935	8.934
Phosphor	Bud – Young	0,000	5.359	11.906
	Bud – Old	0,000	4.578	11.1249
	Young – Old	0,627	-4.054	2.492

*Significant p < 0,05

Based on the normality test, generally data (100%) normally distributed with p> 0,05, homogeneity test and corrected model test obtained the same (p> 0,05), so parametric test requirement to be used in analyzing the analysis result was fulfilled. Test result by using one way anova as presented in the above table shows that the nutrient content in each leaf type has a varied difference. The data as presented in the table above, from 5 (five) nutrient types tested, generally showed a significant difference in the three leaf age types with value of p <0.05, except on Fe which is not significant difference between bud leaf and youngleaf p value = 0,709 (p> 0,05) and phosphor with p value = 0,627

DISCUSSION

Moringa leaf is a plant that has very rich in nutrients so this plant is widely used both as a nutrients source and a medicinal plant because this plant also contains many anti-oxidants, so it is classified into functional plant. In West Sulawesi Province, this plant is widely spread from coastal areas to altitude, but not optimally utilized as nutrientsources food, because this plant is very easy to grow, this plant is only wild plants or just as a barrier yard or garden.

Nutrient on Moringa leaf analyzed in this study is limited to 5 (five) types of protein (macro nutrient) and 4 (four) other types including micro nutrients i.e Fe, Ca, P, and Zn, because these nutrient are very closely related to the occurrence of stunting and anemia, where both problems are exist in West Sulawesi Province, and became one of the society health problems [10-14].

Protein

Protein is a nutrient that has high biological value, in addition, its role as a source of energy, also plays a role in various body metabolism and part of the structure and function of the cell. Protein is a nutrient that is very important for every living creature, so it must be available every day in sufficient quantity both quality and quantity. This nutrient deficiency will give a very big impact, especially if it occurs in pregnant women and toddlers in a relatively long time.

Moringa leaves are vegetal food source which containing high enough protein. The previous research reported that the Moringa leaf contains protein (6.8 grams), and contains all the essential amino acids, the concentration may differ according to the character of the region where the nutrient is cleaved due to the soil nutrients contained which affect the nutrient content of the plant [15-17]

Iron (Fe)

Iron (Fe), has an important role in the human body, although it takes less than other nutrients, but its existence in sufficient quantities is very important. Deficiency of Fe in the long term has a serious impact, especially if it occurs in pregnant women and toddlers, because its function as a major element of the formation

of red blood cells and play a role in the process of growth and optimal development, then its existence in sufficient quantities every day is necessary.

Iron in the leaves is part of the chlorophyll, so the older the leaves, the green color is more concentrated while the bud was generally pale green because the chlorophyll was still lacking, the color of the leaves illustrates the constituent chlorophyll of the leaf composition[15-19].

Calcium (Ca)

Calcium (Ca) has a very important role in the process of bone forming (more than 90% Caof the body presents in bones and teeth). Ca deficiency in the long term will affect the bone pitting process, if it occurs in children who are still in the process of growth will experience growth disorders so that the height or length of the child's body will be lower than the child on his age. This will extend the list of children who belong to the short category.

Moringa leaf can be said as a good source of calcium due to the calcium content contained in Moringa leaf based on the research results value higher than the RDA (Recommended Daily Amounts) for calciumwhich is ranging between 700-1300 mg / day [19-24].

Zinc (Zn)

Zn mineral is one of micro mineral type, although it is required very small, but it must be there every day because this mineral also includes essential nutrients to both humans and plants. The results showed a significant difference of Zn content based on leaf age, Fig. 4 shows higher amount of Zn in bud leaves than the other two parts. Zn is a mineral that plays a role in the process of plant growth and is the constituent part of the protein structure some other macromolecule components.

Phosphor (P)

The research result obtained, the highest P content was found on the bud leaf, and the lowest in the young leaf group. The P content in the plant is influenced by the N content in the plant, because one of the N roles in the plant is to assist or regulate the absorption of P. The research result obtained the P content is directly proportional to the Protein content, where the highest protein is in bud leaf, P Also highest on the bud.

Plants absorb P from the soil in the form of phosphate ion, especially H2PO4- and HPO42- found in soil solution. H2PO4 ion is more common in more acid soils, whereas at higher pH (<7) HPO42 form is more dominant. In addition to these ions, plants can absorb P in the form of phosphohumat, nucleic acid and fitin [25-30].

CONCLUSION

There are differences content of protein, Zn and Ca in the 3 (three) groups of moringa leaf flour.

There are differences content Fe in the Moringa leaf flour between the bud leaf and old leaf, and young leaf and old leaf, and there is no difference content of Fe between young leaf and bud leaf.

There are differences content of phosphorus (P) in Moringa leaf flour between bud leaf and young leaf, and between bud leaf and old leaf. There is no difference of P content between young leaf and old leaf of Moringa.

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A Genetic Algorithm based Protein Signal Pathway Analysis

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ABSTRACT

In recent research, the analysis of protein path signaling is one of the complex tasks due to topological changes and hence to find the shortest path routing in protein path signaling turns out to be a dynamic problem. There are numerous algorithms available to find shortest path which is having a polynomial time complexity. These algorithms are successful for conventional protein analysis. But, they demonstrate an intolerable high processing complexity in real-time connections linking swiftly due to changes in pathway signaling. Hence the genetic algorithm has been chosen to solve this optimal route shortening in protein pathway signaling. As genetic based solution is a heuristic search algorithm, it is found to be one of the best algorithms for dynamic optimization problem. Hence, in this proposed genetic algorithm and its operators are applied in the existing minimum spanning tree is solved this dynamic shortest path routing problem. Here buffer space was chosen as the metric for choosing the best path which will result in the improved delivery ratio and reduced end to end delay.

Keywords: *Protein, Genetic Algorithm, Shortest Path Route, PPI*

INTRODUCTION

A protein is a one of the necessary rudiments of a cell. Such a protein is proficient for transporting signals and well managing enzymes by using function. This administration is normalizing the creation and actions inside the cell. The essential activity is to converse among proteins, DNA, and other molecules. Generally protein converse have two which are permanent protein-protein interactions (PPI) and cellular processes. The analyses of protein multifaceted are basically groups of proteins carry out to congregate and perform with in cellular. In a protein composite, a province is a vital part of in his possession of job. The present grouping area of a protein resolves their complex functions such as cell expansion, cell preservation, cell signal transduction, cell dictation, cell translation, cell metabolism. Pathway study has turned into well-liked as a minor investigation policy for protein data. The pathway examination conjecture in protein pathway has a combined effect to analysis the disease. The main benefits of pathway study identified the illness vulnerability genes by helping statistical analysis and effects of protein affected area. The major takes of pathway analysis result in understanding information about biologically imminent into the multifarious infection affected system. In addition to that, numerous analysis alteration lumbers can be abridged in pathway study by examination of massive pathway analysis as an alternative of examination thousands of protein. The PPI clutch the sequence concerning the proteins adroitness with additional protein in the biological procedure around the cell. The preponderance of proteins' jam-packed chain is recognized except than molecular function. Hence, this is not completely chronic. The major problem in protein analysis is forecasting because this is one of the complex study in computational biology research. The existing study can assist to investigation and conjecture protein function from bimolecular. This is the key problems which will need to give more attention for more accurate mechanism for recognize PPI within cell.

RELATED WORK

The near-optimal routing algorithm which utilized a modified hopfield neural network (HNN) was described. This is extremely connected in sequence which is obtainable at the narrow neuron, which is quicker junction and improved way is attained with accessible algorithms [1]. An innovative neural network to resolve the shortest path problem for internetwork routing has been

recommended. This is enhanced conventional approach hopfield architecture bring in a two-layer structural design that routinely assurance as whole set suitable solution [2]. New genetic algorithmic approach for variable-length chromosome and genes for indoctrination the crisis were given. The crossover process connections incomplete chromosomes at appositionally self-governing crossing sites for maintain the genetic variety of the inhabitants [3, 4]. A method to resolve the multiple destination routing (MDR) problems without restraint was demonstrated. It is stand on the alteration of the fundamental system of an MDR crisis into its reserve total form [5]. The examination on the request of subdivision swarm optimization (PSO) for resolve shortest path was recommended. Customized precedence support indoctrination includes a heuristic operative for dipping the option of ring formation for subdivision symbol in PSO [6, 7]. An efficient and dynamic clustering scheme was developed to address the issues in routing in heterogeneous wireless sensor networks. It demonstrates the probability of a node in a sensor network to become a cluster head by measuring the average network residual energy estimation. This algorithm is more suitable than existing algorithms for multilevel wireless sensor networking (WSN) [8]. An energy-efficient multilevel heterogeneous routing protocol was developed to conserve energy by segregating all sensor nodes into two different groups based on their residual energy as 'k' level normal nodes and 'k' level advanced nodes.

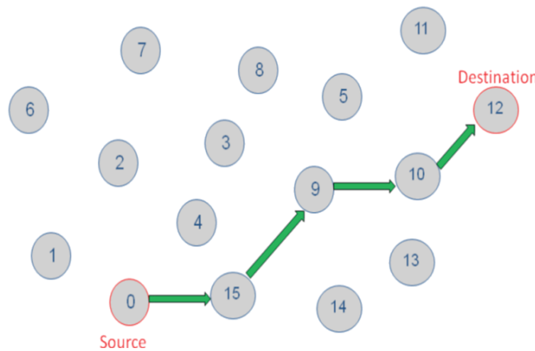
Cluster head (CH) was elected based on weighted probabilities to avert energy holes. Simulation results revealed that it was very good in improving networks lifetime, selection of number of CH per round and stability. A homogeneous and heterogeneous merged layer technique was developed which is an energy efficient routing protocol to increase the lifetime of WSN [9, 10]. The merged layer node deployment pattern of the sensor nodes maximized the working time and contributed to balanced energy in the selection of cluster head by the use of LEACH. A protocol was proposed based on barrier coverage model for intruder surveillance application in wireless sensor networks. In this scenario, they dealt the barrier coverage problem in a mobile survivability heterogeneous wireless sensor network, which consisted of large number of sensor nodes with environmental capabilities [11]. Few researchers investigated the distributed compressive sensing in heterogeneous sensor network and introduced a scheme. In this sensing scheme three different scenarios were explained in which HSN is used for signal acquisition [12]. A multiple attribute decision making protocol was presented to provide a satisfactory service quality in the selection of heterogeneous network. This protocol combined the multiple attribute decision making weighted vectors and simple weighting method which resulted in a combinational weight vector [13]. The requirements of compatibility were not satisfied and so the judgment matrix was modified until the combinational vector satisfied the requirements of compatibility. Two-step algorithm was developed for the concept of pseudo-polynomial. The protocol processed the input data and provided problem in terms of mathematical formulation. It processed the instance to maximize its stability radius and proved that the entire problem can be solved in a number of iterations of a pseudo-polynomial [14]. The approach was scalable and problem was solved to the instances extended to 1000 sensors within fifteen seconds. The algorithm does not consider the problem of routing in the base station which collects the data using multi-hop communication. In this way it was tried to merge the different types of measurement matrix and different numbers of measurements. In view of the computation and communication cost, it was a good compromise between reconstruction percentage and the number of measurements

GENETIC ALGORITHM BASED MINIMUM SPANNING TREE ALGORITHM

Figure 1, the existing system route discovered is not changed until there is a failure. When the When packets are sent through the same route continuously, congestion may occur and there may be drop of data packets. In proposed system, genetic algorithm is applied to find the optimal shortest path. The fitness value for optimal path buffer space in conventional path-way the path between the source and the destination is found by the regular route discovery process. This will not consider any metric during route discovery. This route is not changed until there is a link failure. When data packets are sent through this path continuously congestion may occur. When congestion occurs, the data packets are dropped. The conventional path-way does not contain a congestion prevention mechanism. Hence there will be loss of data packets and increased delay. In this project the optimal route between the source and destination is found by applying the genetic algorithm. This optimal path will have the highest buffer space. Hence the probability of

occurrence of congestion in this path is less and this path will be more reliable and the delivery ratio will also be improved.

EXISTING SYSTEM **PROPOSED SYSTEM**



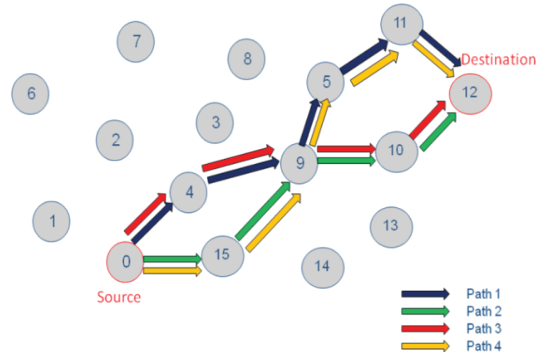


Figure 1 Existing and Proposed Systems

The complete architecture of our research is given in Figure 2. Initial step of this project is forming the initial population made of Chromosomes or random paths between source and destination. Then the Fitness function of each chromosome is analyzed. Best chromosomes are chosen and the genetic operators are applied to them and then the optimal solution is found from the new population generated.

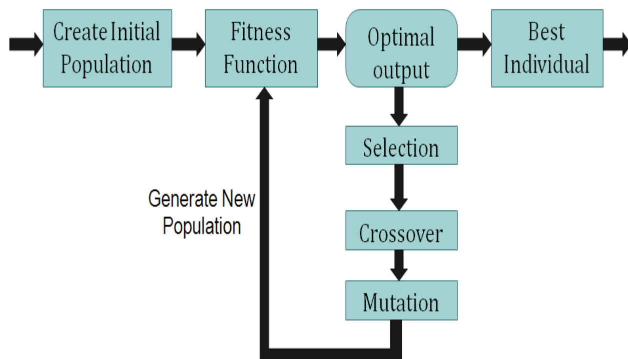


Figure 2 Architecture Diagram

METHODOLOGY

Algorithm I

The dynamic shortest path routing problem in protein pathway signaling is a one the current dynamic optimization problem. The purpose of this method is to rapidly hunt the new optimal least cost acyclic path over the rapid change of topology. This optimal shortest path is found using genetic algorithm by applying its operators. The PATH-WAY protocol has been chosen to implement the genetic algorithm. In existing PATH-WAY the path between the source and destination is found by regular route discovery process, but this protocol finds the optimal path with the best buffer space. While finding the optimal path in genetic algorithm, first the initial population is found. The initial population consists of set of chromosomes which are the possible paths from the source to the destination. From these chromosomes the selection process is done. In this process the chromosomes that satisfy the fitness criteria are selected. Then the crossover operation is done on these selected chromosomes, thereby creating the next generation of chromosomes. The algorithm 1 explains best among these chromosomes are then selected as the optimal path and data packets are sent through this optimal path. Since the path with the highest buffer space is chosen as the optimal path it may survive for longer time than the normal path found without genetic algorithm.

```
GA based MST algorithm:
   Set  GA is a  vertex of G
   while (GA less than vertices)
   {
     Discover  the  minimum   edge  connecting
GA to G(GA)
      Store in to GA
   }
Create the GA using (V,E,W)
      initially (v,-,infinity) for every vertex
      set GA set is Empty
   while (GA has fewer Vertex)
   {
      let  (V,E,W)  have  the  smallest  weight  at
GA
      delete (V,E,W) from GA
       for each edge GA(u,V)
      if U is not already in Ga
         find  value (U,G,W) in GA
        if GA(F) < GA(G)
         update (U,G,GA(G)) with (U,F,GA(F))
```

IMPLEMENTATION SETUP

The implementation, this paper used network simulator for experiments purpose which can be analyzed

the performance of conventional vs our proposed method. The primary focusing on simulations which is ready to simulate GA based protein signal pathway which can easily to discover shortest path with minimum span of time. In the following sections different metrics are used to evaluate the performance which is described in figure 3 and 4.

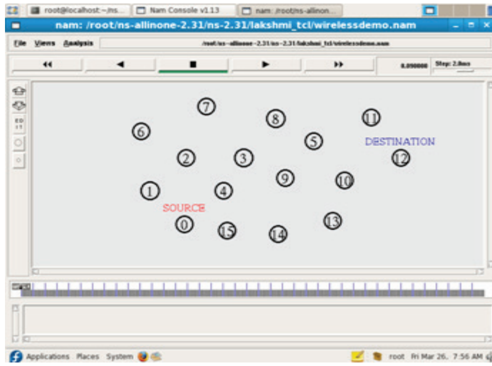


Figure 3 Creation of Network Topology

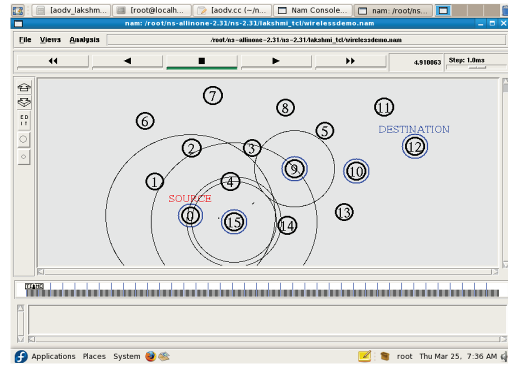


Figure 4 Data Flow in Optimal Path Found

Through Genetic Algorithm

AVERAGE COMPUTING DELAY

Figure 5 illustrates that the concert of the GA-MST has been evaluated against conventional method by provisions of speed which can find the signalling pathway as quick as possible. The average of 100 times tested and analyzed. The results demonstrated that the GA based methodology can perform when compare with convention methods due to fast speed process. Hence, it achieved in reduction of the delay. The existing algorithm took more time due to redundant work and converged more distance in massive data set. In this analysis, the computations involved more and complicated multidimensional sets. But, the new approach used GA based mechanism where as the conventional approach used brute-force approach. For this reason, the GA based approach extremely produced best performance in terms of speed and decreased delay

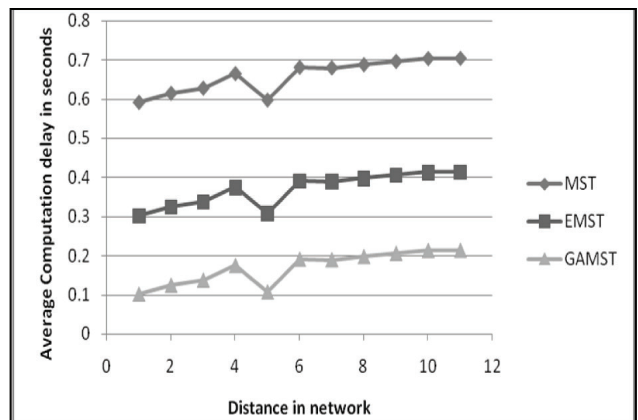


Figure 5 Number of Cluster vs Computation Time

SIMILARITY ANALYSIS

The figure 6(a) and 6(b) shows the results regarding the similarity matching as well as error ratio with respect to number of cluster. The GA-MST presented better results when compared with traditional approach. The GA-MST covered the entire data sets and matched more the 90% accuracy when compared with other approach.

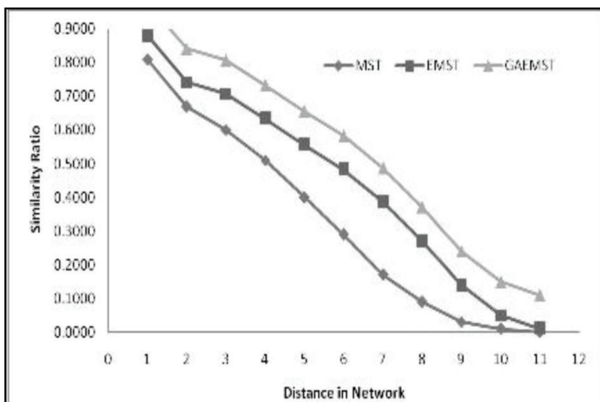


Figure 6(a) Number of Cluster vs Similarity Ratio

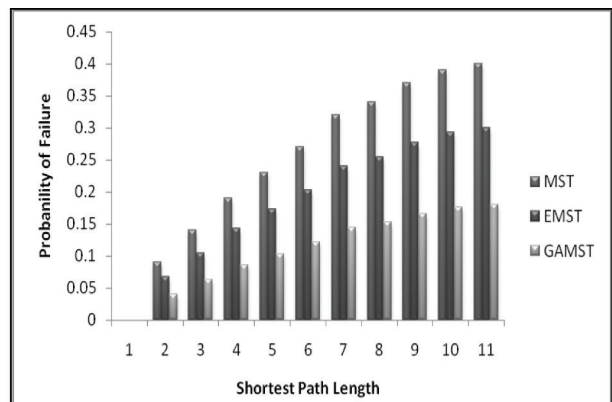


Figure 6(b) Path Length Vs Probability Failure

Hence, this is can be support for protein pathway processing in effective manner. The main advantage of this method can easily do crossover among different clusters which is not possible in existing approach, hence those methods are affected and presented improper output.

CONCLUSIONS

Protein pathway signalling aims to create a multi-hop onward path between source and destination. This is one the imperative issue that considerably influences its performance. The existing routing algorithms are not effaced due to rapid changes in signal pathway. This is the major difficult task to find pathway with the dynamic changes in signalling pathway in protein pathway signalling. This article studies the usage of GAs for solving the dynamic problem and implemented dynamic shortest path routing problem in protein pathway signalling. This model builds with help of GA over the protein pathway signalling. The dynamic shortest path routing problem delivered successfully from source to destination with minimal time. This study also influenced to carry out future work and make it general purpose model to investigate protein related problems. The second future direction is to examine the relevance of GAs for solving pathways in protein.

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Bureaucratic Reform of Health Services in Merauke Regency Under an Institutional Perspective

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ABSTRACT

Health Services in Merauke Regency have not been adequate yet for the demand of society and therefore, institutional bureaucratic reform needs to be done in order to provide services that can give satisfaction to communities. This research aims to give an overview of health service bureaucracy reform under an institutional perspective in Merauke Regency as well as to further develop this theoretical perspective in order to improve its use in empirical researches. For the analysis, this research employs a qualitative approach with an interactive analysis in which the use of four institutional dimensions such as autonomy, adaptation, complexity, and coherence employed in the analysis of health service reform greatly influences the process of providing services, especially health care for communities. From the institutional point of view, the health service reform has been implemented but its result does not meet the expectation of society. Furthermore, the results of this study are expected to provide input for the Indonesian government to conduct bureaucratic reform so that institutions can run effectively and efficiently.

Keywords: *Bureaucratic Reform, Health Services, Institution*

INTRODUCTION

The development of the health sector provides a large proportion of efforts to improve the level of community welfare. To assure the attainment of this intention, the government has issued Law No. 36 of 2009 on health, which has a similar point to the Regulation of the Minister of Health No. 741/Menkes/Per/VII/2008 on Minimum Health Service Standards in Regencies/cities as well as to Ministerial Decree of Menpan (Minister of Administrative and Bureaucracy Reform) No. 63/KEP/M.PAN/7/2003 on Implementation Guidelines for Public Services.

In line with efforts to reform the bureaucracy in Indonesia, the government issued Law No. 17 of 2007 on the National Long-Term Development Plan (RPJPN) 2005-2025 mandated that the development of state officials is done through bureaucratic reform to support the success of development for other fields. In line with this regulation, it is expected that the increase of health services for communities, which is a basic right owned by citizens, is realized. It is in line with what Robert M. Sade [1] says that among economic sectors, health care has led to a shift towards the government dominance for decades. This shift is driven by the idea that there is a right to health care which is a concept firstly articulated by Franklin Delano Roosevelet in his speech to Congress in 1944. In that occasion, he spoke of a new set of basic rights including "the right to adequate medical care and the opportunity to achieve and enjoy good health."

In relation to health services in Merauke Regency, a number of problems occur on a daily basis. Merauke Regency is one of the largest regencies providing in which its total area is 46,790.63 sq km. The total area covers the population of 213.075 people up to 2012, 20 districts / sub-districts, 160 villages, and 8 urban villages. Furthermore, in the process of providing services to the community in Merauke Regency, the facility or infrastructure is only supported by 5 hospitals of which there is 1 hospital with C type and 21 units of Community Health Centers (PUSKESMAS).

In addition, health services to the community in Merauke Regency have not yet been implemented maximally or in other words, there should be efforts to improve the level of public health. It is proven by some facts showing that health services in Merauke Regency have not been maximal like the following ones:

Converted from the number of infant deaths which is 64 babies, the Infant Mortality Rate (IMR) of Merauke Regency in 2016is 17.1/1,000 KH(Live Birth) with which the target of MDG (Millennium Development Goals) in 2017is< 17/1,000 KH. Meanwhile on a national scale, the current IMR is 35/1,000 KH;

Converted from the number of under-five mortality which is 30 toddlers, the Under-five Mortality Rate (U5MR) of Merauke Regency in 2016 is 25.1/1,000 KH with which the target of MDG in 2017 is< 23/1,000 KH;

Converted from the number of maternal deaths which is 20 expectant mothers (2 in prenatal stage, 16 in intranatal stage, and 2 in postpartum stage), the Maternal Mortality Rate (MMR) of Kabupaten Merauke in 2016 is 533/100,000 KH with which the target of MDG in 2016 is < 118/100,000 KH. Meanwhile on a national scale, the current MMR is 307/100,000 KH;

Life Expectancy At Birth (LEAB) of Merauke Regency is 62.25 years and it is lower than the LEAB of Papua which is 64.53 years (the national LEAB is 71.76 years).

The number of deaths due to HIV/AIDS in 2015 is 25 persons so that the total number of deaths is 380 persons until December 31st, 2016.

In relation to the issue of institutional reform, the government represented by its bureaucracy seems to be slow in the process of organizational change and in providing health services to the community. It is in line with the statement of Kim and Prescott [2] accurately describing that many changes initiated by the government are metamorphoses (i.e., the scope is wide but applied very slowly). The government argues that these changes, in spite of their wide scope, are gradual. Thus, the government "does not create a sense of urgency to initiate the necessary strategic and structural changes".

To researcher's knowledge, the issue of health care bureaucracy reform has never been discussed yet by others through using an institutional perspective based on Samuel Hantington's (1968) terms namely: Autonomy, Adaptation, Complexity, and Coherence. Moreover, this research uses a qualitative approach. In this research, we focus on the health service bureaucracy system by using Samuel Hantington's institutional perspective in the form of interview on health service system at the Department of Health in Merauke Regency through an interactive method that will be analyzed qualitatively.

MATERIALS AND METHOD

In a broad outline of this research, the data analysis which is going to conduct will be analyzed by using an interactive model. an interactive analysis includes: Data Collection, Data Reduction, Data Display, and Conclusion Drawing/Verification. The interactive model can be described as follows:

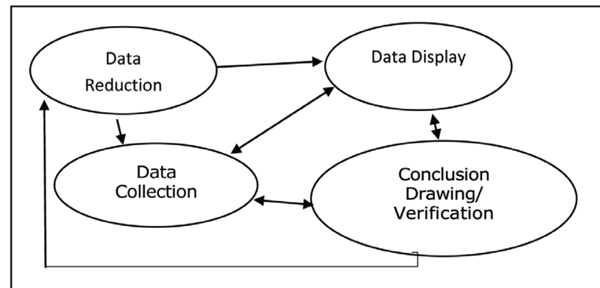

Figure 1. Interactive Model

Furthermore, triangulation technique is employed to perform data validation. Triangulation technique is the technique of checking the data validity by utilizing variables or factors outside the data for the checking purpose or as a comparison to the data. A commonly used triangulation technique is the checking through other sources.

RESULT AND DISCUSSION

In connection with bureaucracy reform in the organization of the Department of Health in Merauke Regency, efforts to make significant changes are temporarily carried out with the intention to improve services to the community. Thus, the vision and mission that have been formulated from the ministerial level to the level of department can be realized. The vision of Department of Health in Merauke Regency is "The Realization of Healthy, Independent and Fair Merauke Community". To achieve the established vision, significant changes from the institutional perspective are necessary so that the entire community of Merauke Regency can have the benefits.

In relation to the institutional perspective, bureaucratic reform is an effort to improve institutional structure; management structure; human resources structure; accountability and public services with the

direction to promote a good and clean government. In this case, the Community Health Center (agent) as the subject of health service activities to the community can work more efficiently and effectively.

To discuss the issue of reform, four institutional dimensions as the focus of this research are employed as follows:

Autonomy

Budget

The issue of autonomy is one of the factors that helps determine bureaucracy reform especially in the process of public health services. In this case,the independence of the Department of Health in terms of budget and autonomous sources of income is required. In connection with bureaucratic reform of health services, the Department of Health in Merauke Regency is also autonomous, which autonomously uses the budget derived from the Regional Income and Expenditure Budget (APBD) of Merauke Regency.

The fact shows that the budget allocation from the APBD of Merauke Regency which is Rp 88,961,846,349, - is still not sufficient to finance the health service itself nor to finance the operational of the health service as a whole. It happens because the area of service has a great distance from the capital of Merauke Regency so that it requires a considerable amount of funds, especially for the addition of incentive fees that must be paid to the officers in the field.

Source of Income

In line with Presidential Regulation No. 32 of 2014 on the Management and Use of JKN (National Health Insurance) Capitation Fund in the First Level Health Facility (FKTP) of the Local Government or better known as Community Health Center (Puskesmas), the purpose of this regulation is to improve the quality of health services in the implementation of the National Health Insurance. With the existence of this National Health Insurance, health services provided by the Community Health Center are free of charge.

The compensation provided by the government through the Capitation Fund is one of the sources of income owned by the Community Health Center since there is no other source of income that can be managed by the Community Health Center. In fact, the government's dependence on this Capitation Fund is Rp 8,000, - per person. Thus, with the total population of 213,075 persons in the level of Merauke Regency, the entire Capitation Fund in total provided to all Community Health Centers is Rp 1,704,600,000, - (one billion seven hundred and four million six hundred thousand rupiah). Based on the presidential regulation, this fund is given every month and transferred directly to the bank account of the Community Health Center.

Adaptation

Organizational adaptation refers to modifications and changes in the organization or its components to adapt to changes in the external environment. The goal is to restore a balance from an unbalanced state. Adaptation generally refers to a process, not an event, where changes are institutionalized within an organization. Adaptation does not necessarily mean reactivity in the part of the organization because proactive or anticipatory adaptation is also possible. However, the emphasis must be in response to some discontinuities or inconsistencies arising between the organization and its environment [3,4].

An established organization is an organization that can adapt itself to environmental changes. Likewise, the Department of Health in Merauke Regency and the Community Health Center as a public organization also adapt to the changes. In connection with the demand of bureaucratic reform, the Department of Health also seeks to reform bureaucracy in order to further improve its ability in serving the community, especially in terms of public health services. Thus, it will form a synergy among each of the composition in an environment. Cyert and March [5] argue that this equilibrium state is not static but it will continue to change into a new equilibrium state in response to changes in organizational goals as well as the demand and pressure of dynamically environmental changes. It is also possible due to the increasing demand for services from the community of Merauke Regency who wants better health services from the government as a service provider.

Furthermore, Astley Van de Ven [6] suggests that to explain the process of organizational adaptation, three main aspects need to address, which are: (1) aspect of structure, (2) aspect of change demand, and (3) aspect and manager'sbehavior and role.

Furthermore, Nir Kshetri and Ramad Ajami [7] state that the nature of selective adaptation is a function of

perception, complementarity, and legitimacy (Potter, 2004). First, the processes and results of selective adaptation depend on how policy-makers and other agents of institutional change understand the “objective, content and effect” of foreign and local institutional arrangements [8,9]. Legitimacy is about the extent to which local communities support the objectives and consequences of selective adaptation.

Thus, in the process of undertaken bureaucratic reform, the Department of Health in Merauke Regency as the principal or job owner needs to adapt to support the sustainability of the organization in the future. Therefore, changes regarding organizational structure and aspect of demand to change from both government and society are needed so that the reform will have an effect on the process of health services provided to the community.

Complexity

A local bureaucracy must be full of functions not structures so that it can fulfill (the efficiency, effectiveness, and economy). The reform of the bureaucracy through restructuring and the most recent Organizational Structure and Working Procedure (SOTK) by the Local Government of Merauke Regency, and more specifically the Department of Health and Community Health Center, at least ought to lead to the actualization of the suitability between Health Service and the demand of services.

Moreover, the presence of spatial differentiation or significant differences of service are a determines the success rate of the health care program implementation throughout Merauke Regency. The vast area of service requires the Department of Health in Merauke Regency to design a good organizational structure so that it can deal with the duties and responsibilities in the field of public health services.

Gibson [4] argues that complexity is a direct result of the division of labor and the establishment of departments. Specifically, it refers to a very different number of jobs or grouping of positions and a really different number of units or departments. The main idea is that organizations with different types of jobs and units create more complex managerial and organizational problems than the ones with a few types of jobs and departments.

Finally, the Department of Health in Merauke Regency serving as the principal in delegating service duties to all Community Health Centers as the existing agents needs to have an agreement or deal regarding the obtained results or outputs. Even, these delegated duties related to public health services have a high level of complexity so that the pseudo agreement or contract between the Department of Health and the Community Health Centers can be done [10-12].

Coherence

The fact shows that there is no coherence related to the planning made between the Department of Health and Community Health Centers in which the Community Health Centers as the front line in providing health services to the community are often negligent in carrying out the plans handed down by the Department of Health. Besides, a mismatch of officers with their possessed expertise occurs and gives a serious impact to the provided services. In addition, the inadequate mentality of officers can be seen from the presence level of the officers who are often absent in the Community Health Center as a service center to the community [12-14].

Based on the explanation above, it is true that the level of coherence or conformity which can be well maintained will be very helpful for managing the workload and developing procedures for a punctual process of duties. Organizations that have no conformity will eventually fail because they do not have the capacity to respond to changes in all operating environments. However, it will lead to inflexibility when conformity acts solely. It then weakens the organization sooner or later. It is the reason that the duty of the principal, the Department of Health in Merauke Regency, needs to create the institutional capacity to involve in a continuous renewal or reform.

CONCLUSION

The conclusion drawn from this research is that the reform of health service bureaucracy in Merauke Regency has been implemented by the Department of Health even though the results have not been maximal yet to meet the expectation of the whole community in Merauke Regency that needs health services.

Furthermore, it is also expected that researches related to the reform of health service bureaucracy emphasizing the institutional dimensions other than the four institutional dimensions discussed in this research can be done. Thus, the results of the researches can be

useful for the development of insight into bureaucratic reform in the institutional perspective.

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Conflict of Interest : Authors declare that there is no any conflict interest within this publication

Ethical Research: Taken from university and the agreement with all respondents

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Study of Excess Fluoride Ingestion and Effect on Liver Enzymes in Children Living in Jodhpur District of Rajasthan

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ABSTRACT

The study was carried out in selected villages of Jodhpur district of Rajasthan. Study area was divided into four categories with different fluoride level in drinking water. Total 100 children aged 8-14 years were screened for dental fluorosis and biochemical analysis. 25 children were selected from each category. The dental fluorosis case was determined following dean's classification. Fluoride level in blood (serum) sample was estimated with the help of F ion specific electrode (Thermo Scientific Orion Star A329, USA), by Hall et al. method. The serum samples of children were investigated to assess liver function using Auto analyzer. The current study reveals that Fluoride content in blood serum significantly associate with serum SGOT, SGPT and ALP level. Serum level of Fluoride and ALP significantly higher in children living in high Fluoride content drinking water.

Keywords: *Serum ALT, AST, ALP, fluoride, Jodhpur district.*

INTRODUCTION

Dental fluorosis is a developmental disturbance of dental enamel, caused by successive exposures to high concentrations of fluoride during tooth development, leading to enamel with lower mineral content and increased porosity. World Health Organization has set the upper limit of fluoride concentration in drinking water at 1.5 parts per million[1]. Fluorine is essential for the normal mineralization of bones and formation of dental enamel. Fluorides (F) are mainly found in ground water[2]. Higher fluoride concentration exerts a negative effect on the course of metabolic processes and an individual may suffer from dental fluorosis, skeletal fluorosis, non-skeletal manifestation or a combination of the above[3]. There is a risk of endemic fluorosis where the fluoride level is more than 1.0 ppm in drinking water[4]. The severity of dental fluorosis depends on when and for how long the overexposure to fluoride occurs, the individual response, weight, degree of physical activity, nutritional factors and bone growth suggesting that similar dose of fluoride may lead to different levels of dental fluorosis[5]. The available data suggest that 15 states in India are endemic for fluorosis (fluoride level in drinking water > 1.5 ppm) and about 62 million people in India suffer from dental, skeletal and non-skeletal fluorosis. Out of these 6 million children's are below the age of 14 years[6]. The principal source of fluorine was drinking water and food such as sea fish, cheese and tea[7]. India was one of the worst fluorosis affected countries with large number of people suffering.Excess fluoride ingestion through drinking water and other food items effects on various organs like liver, kidney, endocrine systems and bones[8]. and it can rapidly cross the cell membrane[9]. Liver is highly susceptible to the fluoride intoxication because of main organ for fluoride detoxification. Degeneration and necrosis of liver cells results increase in ALP, AST and ALT. The elevated ALP, AST, ALT is an indication of the impairment of liver functions. Various studies showed that elevated levels of serum hepatic and renal enzymes have been found following fluoride intoxication indicating degenerative and inflammatory damages to the liver[10,11,12]. A study done by Michael et al. reported that high levels of fluoride disturbs the normal

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ALT and AST values in human[13] study was conducted for investigating the effect of high dose of fluoride intake from drinking water on some soft tissues. In Rajasthan, All the 33 districts are endemic for fluorosis, Jodhpur is one of the districts and so far no data are available on the severity and toxicity of fluorosis in children. The aim of the study was to find out the relationship between excess fluoride ingestion with serum fluoride level and the liver enzymes in children living in different fluoride concentration area.

MATERIALS AND METHOD

The study was carried out in selected villages of Jodhpur district of Rajasthan in total of 100 children. 25 children from each category as per sampling design and fluoride level in water sources were screened for dental fluorosis and biochemical analysis. The dental fluorosis cases of children age 8-14 years was determined following dean's classification. Skeletal fluorosis cases, if found was also recorded. Drinking water samples collected from the community were analyzed for fluoride level following electrochemical method. On the basis of fluoride ion concentration in drinking water villages of baori block were segregated in four categories. Category I (<1 ppm), Category II (1-1.9 ppm), Category III (2– 3.9 ppm) and Category IV (≥4 ppm) Table No. 1. Children were surveyed house to house for collection of demographical information and assessment of toxicity and severity of dental fluorosis. children aged 8–14 years who were permanent residents of that particular region and who were using the same source of drinking water from birth were included in the study. Children who were not the permanent residents of that particular area and with a change of source of drinking water, those with orthodontic brackets, dentofacial deformities or any syndromes or uncooperative, medically and physically compromised patients were excluded from the study. Information was recorded in specially designed proforma.

Table 1. Villages categorised on the basis of fluoride concentration in drinking water.

Category	Fluoride level in drinking Water (ppm)
Category I	Water sources having fluoride level <1
Category II	Water sources have fluoride level ranging from 1-1.9
Category III	Water sources having fluoride level ranging from 2 – 3.9
Category IV	Water sources having fluoride level ranging from ≥4

Dental fluorosis by Dean's classification:

Dental fluorosis is characterized by Dean's classification[14].

Sample Collection: Samples of blood were collected in plain vial and left to clot at room temperature and the serum was separated by centrifugation [15]. Fluoride level in Serum sample was estimated with the help of F ion specific electrode (Thermo Scientific Orion Star A329, USA), by Hall et al. Method[16]. The serum samples of children were also investigated to assess liver enzymes ALT, AST, and ALP using Auto analyzer.

Ethical Clearance: Ethical approval was granted from the Institutional Ethical Committee of Desert Medicine Research Centre (ICMR), Jodhpur, Rajasthan. All work was performed according to the ICMR guidelines, for human experimentation in biomedical research. Before the sample collection a written consent was obtained from each Participant and their guardian.

FINDINGS

All 100 children in the different sample category the level of fluoride naturally ingested from drinking water. Fluoride content in blood serum 0.02-0.09 mg F–/L (ppm) in category I, 0.02-0.09 mg F–/L (ppm) in category II, 0.02-0.31 mg F–/L (ppm) in category III and 0.04-0.06 mg F–/L (ppm).Table No 2. The data also reveal that they have higher-than-normal fluoride content in their body fluids.

Table No. 2: Fluoride content in Serum sample of children with different fluoride level in drinking water sample

Water concentration	Mean±Sd	Median	Serum Fluoride* Range mg F–/L (ppm)
Category I (<1ppm) N=25	0.046±0.022	0.03	0.02-0.09
Category II (1-1.9 ppm) N=25	0.046±0.019	0.05	0.02-0.09
Category III (2-3.9 ppm) N=25	0.11±0.09	0.31	0.02-0.31
Category IV (≥4 ppm) N=25	0.20±0.13	0.28	0.04-0.6

*Fluoride in serum: normal upper limit 0.02 mg/L.

Serum SGOT level (range) in category I was 15 to 26 U/L, Mean± SD (19.88±3.26), 15 to 28 U/L, Mean± SD (22.6±2.51) in category II and in category III it was 18 to 31 U/L, Mean± SD (23.12±3.85). Serum SGPT level were highest recorded in category IV 15 to 32 U/L, Mean± SD (20.20±3.58) median was 21 which was slightly higher than other three categories. Serum Alkaline Phosphatase level in all Category I to IV were recorded high but category IV were recorded 101 to 429 U/L with Mean± SD (238.36±119.52) which was slightly higher than other three categories Table No 3 & 4. Our data showed that fluoride content in serum was significantly higher. Serum alkaline phosphatase may also have some significant role in dental fluorosis. In other biochemical parameter like serum SGOT, SGPT we did not found any association with toxicity of dental fluorosis.

Table3: Range of serum SGOT, SGPT & alkaline phosphatase

Parameter	Group 1 (<1ppm) N=25	Group 2 (1-1.9 ppm) N=25	Group 3 (2-2.9 ppm) N=25	Group 4 (>4 ppm) N=25
SGOT (U/L)	15-26	18-28	18-31	21-45
SGPT (U/L)	12-22	15-24	12-27	15-32
ALP (U/L)	76-240	75-345	94-429	101-634

Table 4: Correlation of serum SGOT, SGPT & alkaline phosphatise with different fluoride concentration group.

Group	Serum SGOT (Mean± SD)	Serum SGPT (Mean± SD)	Serum ALP (Mean± SD)
Group 1 (<1ppm) N=25	19.88±3.28	16.84±3.01	152±47.33
Group 2 (1-1.9 ppm) N=25	22.6±2.51	19.28±2.30	191.56±85.19
Group 3 (2-2.9 ppm) N=25	23.12±3.85	19.24±3.59	236.16±82.06
Group 4 (>4 ppm) N=25	25.88±4.73	20.2±3.58	238.36±119.52

DISCUSSION

Flurosis is a major health problem in many parts of the world. A direct link between the degree of dental fluorosis and the amount of fluoride in drinking water shown by many studies[17,18,19]. The fluoride-related problems are closely associated with climate. In hot tropical part of the world, people consumed more water and consequently, the risk of fluoride accumulation increases[20]. The present study was conducted in the Baori block, Jodhpur district of Rajasthan, where fluoride concentration in drinking was ranged from 0.8 ppm to 10 ppm in different water resource of various villages. ground water fluoride concentration are high in india and china according to W.H.O.[21]. The liver is highly susceptible to fluoride toxicity due to presence of very active metabolism site[12]. Some animal and epidemiological studies revealed that exposure to excessive fluoride could induce damage to the liver [22]. Furthermore, some animal experiments showed that a significant dose–effect relationship was detected between water fluoride levels and damage

to the liver functions[23]. Xiong X et al suggested that excessive (i.e.42.0 mg/L) fluoride in drinking water may cause damage to children‟s liver function[24].A study conducted by Pratheebaa P. et al revealed that the enzymes ALT and ALP were positively correlated with the occurrence of fluoride, while AST, LDH, were negatively correlated with the existence of fluoride[25]. It still controversial that excessive fluoride intake induces damage to human liver functions or not . A study done by Michael et al. showed that fluoride may disturb protein synthesis and elevate the liver enzymes activities (ALT and AST)[13]. However, some reports do not support this fact. The study conducted by Liang et al. on the liver functions including of individuals from six different fluoride contents in drinking water found no significant changes[26]. Water fluoride concentration was between 1.5 and 23.0 mg/L, no damage to liver functions was also observed in residents[27].

CONCLUSION

The particular comes out can be utilized as preliminary data. Our study suggested that increased serum fluoride level may be the possible cause to increase liver enzymes. To achieve better health management they need special care, attention. and also require awareness for safe drinking water. Further studies in large sample are to be needed for better understanding the relationship between liver function and ingestion excess content of fluoride.

Conflict of Interests: All authors declare no conflicts of interest.

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Nurse-Led Early Initiation of Breastfeeding on the LATCH Scoring System

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ABSTRACT

Objective: The aim of this study was to evaluate the effect of nurse-led early initiation of breastfeeding on LATCH breastfeeding assessment.

Materials and Method: An evaluative quasi-experimental study was conducted after ethical approval. The setting of the study was the Labor Theatre (LT) of a tertiary referral hospital of Udupi district in south India. A total of 24 mother-newborn dyads were recruited to the experimental group and 22 mother-newborn dyads were recruited to the control group.

Results: Majority of the mothers in the experimental group 22 (91.7%) and control group 20 (90.9%) were in the age group of 20-30 years. Majority of the newborns in the experimental group 14 (58.3%) were males; whereas majority of the newborns in the control group 12 (54.4%) were females. The independent sample 't' test computed to find the effectiveness of nurse-led early initiation of breastfeeding on LATCH scores obtained at the end of first postnatal day showed a statistically significant difference between the experimental and the control group (t = 6.152, p =0.001).

Conclusions: Newborns with latch-on problems cause stress not only for the mother but also for the staff catering to the mother-newborn dyads and often this may result in early termination of breastfeeding itself. This study found that nurse led early initiation of breastfeeding is helpful in improving LATCH scores. Since early initiation of breastfeeding is very important for continuation of exclusive breastfeeding, all the health care professionals who provide care to the mother-newborn dyads must put sincere efforts to promote this best practice.

Keywords: *early initiation, breastfeeding, LATCH breastfeeding assessment, mother-newborn dyads*

INTRODUCTION

Breastfeeding is nature's health plan. Early initiation of breastfeeding i.e., within half an hour of birth is one of the ten steps to successful breastfeeding. The Baby Friendly Hospital Initiative (BFHI) worldwide is dependent on this important step. This apparently is the fourth step of BFHI that is to 'help mothers initiate breastfeeding within half-hour of birth' during the fourth stage of labor.(1) Breastfeeding should be initiated within the first hour of birth, then exclusive breastfeeding continues and further breastfeeding can be complemented with other complementary feeds thereafter for at least two years. (2) Exclusive long-term breastfeeding depends on this single act of early initiation of breastfeeding. (3)

Even though breastfeeding is an innate biological trait, successful initiation and proper latch-on is still a complex task for both the mother as well as her

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newborn. Newborns with latch-on problems cause stress not only for the mother but also for the staff catering to the mother-newborn dyads and often this may result in early termination of breastfeeding itself. Breastfeeding is thus a learned skill. It is essential that health care personnel, especially the nurses support the mother-newborn dyads in mutually learning the skill of breastfeeding. A randomized clinical trial conducted to assess the effects of skin-to-skin contact (SSC) on initiation of breastfeeding, success of first breastfeed and duration of lactation found that the experimental group had higher success of first breastfeed (mean 8 %, 95 % CI 1.6 % to 17.6 %). The study also showed higher duration of exclusive breastfeeding as compared to controls, implying that early initiation and close contact between the mother and newborn is essential for successful breastfeeding. [4]

To measure breastfeeding effectiveness, several factors are used that include mother's correct positioning of her newborn at the breast, her comfort level, type of nipple, infant feeding techniques and the like.[5-8] The LATCH breastfeeding charting system is a system of documentation of lactation that helps in evaluating the efficiency of lactancy. It also identifies areas where intervention is required to support continued breastfeeding and focuses on the role of mother in the process of breastfeeding.[9] The LATCH breastfeeding tool is a compatible, reliable and appropriate tool to evaluate the efficiency of lactancy. [10] The tool assesses five areas that affect exclusive breastfeeding initiation that are latching, swallowing, type of nipple, the comfort level and the positioning. [11-13]

It is important that mothers are motivated by their primary care takers i.e., the nurses to initiate breastfeeding early and continue breastfeeding. A systematic review also highlights the fact that additional high quality studies are required to further clarify the combined effects of early initiation and breastfeeding patterns. [14] Health care professionals profoundly the nurses, who are primary care-takers, should help the mothers in this task of early initiation of breastfeeding, so that these mothers may continue to exclusively breastfeed their infants for a longer duration. This study was attempted to evaluate the effectiveness of nurse led early initiation of breastfeeding on the LATCH breastfeeding scoring system.

MATERIALS AND METHOD

An evaluative quasi-experimental post-test only control group study was conducted after ethical approval of the Institutional Ethical Committee (IEC) of Kasturba Hospital, Manipal (Reg NO. ECR/146/Inst/KA/2013-IEC/2014). The setting of the study was the Labor Theatre (LT) of a tertiary referral hospital of Udupi district in South India. Participant Information Sheet (PIS) that contained information regarding the study was given to all primi and multi mothers when they were admitted to the Labour Theatre (LT). Following this, informed written consent was obtained. The mother-newborn dyads were chosen to be included in the study if the following inclusion criteria were fulfilled. A nurse-led early initiation of breastfeeding was planned to be provided for the mother-newborn dyads in the experimental group.

Inclusion criteria

Primi and multi mothers who:

- delivered spontaneously at term (after 37 completed weeks of gestation)
- underwent either normal or instrumental assisted delivery

Exclusion criteria

Primi and multi mothers who:

- were posted for emergency Caesarean section
- had complications like prolonged labour
- had postpartum complications like postpartum hemorrhage

Newborns who:

- had birth asphyxia
- needed resuscitation at birth
- had Apgar scores below 5

A total of 24 mother-newborn dyads were recruited to the experimental group and 22 mother-newborn dyads were recruited to the control group. The mother-newborn dyads in the control group received routine care.

Baseline data of the mother-newborn dyads were collected using the baseline proforma. The LATCH (Latch, Audible swallowing, Type of nipple, comfort and hold/positioning) breastfeeding charting system that was developed to document lactation in 1994[9] was pretested and checked for inter-rater reliability on twenty mother-

newborn dyads admitted to the postnatal wards of the tertiary referral hospital. The LATCH breastfeeding charting system was found to be reliable (r = 0.97) to be used for the population to be included in the study.

The LATCH charting system yields a maximum score of two and a minimum score of zero for each item. The tool assesses five areas that affect exclusive breastfeeding initiation that are latching, swallowing, type of nipple, the comfort level and the positioning. If the score obtained is between 7- 10 it is considered to be good LATCH and a score of 0-6 is considered to be poor LATCH.

Breastfeeding assessment was done on the mother-newborn dyads in both the experimental as well as the control group during one episode of breastfeeding using the LATCH charting/scoring system in the immediate puerperium i.e., on the first postnatal day (within 24 hours of childbirth). The results of the study are reported as mean values and standard deviations. To find the effectiveness of nurse-led early initiation of breastfeeding on LATCH scores an independent sample ‘t’ test was conducted using the software SPSS Statistics 16.

RESULTS

The baseline characteristics of the mother-newborn dyads are presented in table 1. Majority of the mothers in the experimental group 22 (91.7%) and the control group 20 (90.9%) were in the age group of 20-30 years. The data also show that majority of the newborns in the experimental group 14 (58.3%) were males; whereas majority of the newborns in the control group 12 (54.4%) were females.

Table 1: Baseline characteristics of mother-newborn dyads (N=24+22=46)

Sample characteristics f		**Experimental group (n=24)**		**Control group (n=22)**	
		%	**f**	**%**	
1	Age (in years)				
	20-30	22	91.7	20	90.9
	31-40	2	8.3	2	9.1
2	Educational qualification				
	Primary	4	16.7	1	4.5
	Secondary	4	16.7	6	27.3
	Pre-university	8	33.3	6	27.3
	Graduation	5	20.8	9	40.9
	Post-graduation	3	12.5	-	-
3	Parity				
	Primi	13	54.1	11	50
	Multi	11	45.9	11	50
4	Type of delivery				
	Spontaneous vaginal	22	91.7	14	63.6
	Assisted instrumental	2	8.3	8	36.4
5	Gender of newborn				
	Male	14	58.3	10	45.5
	Female	10	41.7	12	54.5
6	Gestational age at birth				
	$36^{0/7}$ to $37^{6/7}$ weeks	8	33.4	15	68.2
	$38^{0/7}$ to $39^{6/7}$ weeks	16	66.6	7	31.8

Effectiveness of nurse-led early initiation of breastfeeding on LATCH scores:

To check the effectiveness of nurse-led early initiation of breastfeeding on LATCH scores, an independent sample 't' test was done. The results of the test are presented in table 2.

Table 2: Effectiveness of nurse led early initiation of breastfeeding on LATCH score obtained using the LATCH charting system between experimental group and control group.

***n* = (24+22=46)**

	Experimental group (n=24)	Control group (n=22)	't'	*p*
Mean ± S.D	8.4167± 1.17	6.22 ± 1.23	6.152	0.001*

* Significant at < 0.05 level of significance

The independent sample 't' test computed to find the effectiveness of nurse-led early initiation of breastfeeding on LATCH scores obtained using the LATCH charting system at the end of first postnatal day showed a statistically significant difference between the experimental and the control group (t = 6.152, p =0.001). This implies that nurse-led early initiation of breastfeeding is effective in improving the LATCH scores even within a day of early initiation of breastfeeding.

DISCUSSION

This study determined the LATCH scores on the first postnatal day after nurse led early initiation of breastfeeding. Our results support the hypothesis that early initiation of breastfeeding helps in improving the LATCH scores. The study results echo the findings of a prospective randomized study with 59 mother-newborn pairs who were between 38 to 42 weeks gestation that significant differences were in favor of the group using early SSC in exclusive breastfeeding at 24 h of life (89.9 % versus 63.3 %, p < 0.001). [15]

The results of the present study are also in line with another randomized clinical trial that found that initiation of breastfeeding with SSC had higher success of first breastfeed (mean 8 %, 95 % CI 1.6 % to 17.6 %). This study provided evidence that early initiation and close contact between the mother and newborn helps in successful breastfeeding.[4]

The importance of early initiation of breastfeeding is recognized by the World Health Organization (WHO), which recommends that mothers initiate breastfeeding within one hour of birth. Babies to be placed in SSC with their mothers immediately following birth for at least an hour that increases likelihood of exclusive breastfeeding for one to four months of life as well as the overall duration of breastfeeding.[16] A systematic review also provides evidence that early initiation of breastfeeding as a simple intervention that should be universally recommended.[14]

The results of the present study are supported by a randomized controlled trial conducted on effect of counselling related to breastfeeding at the hospital after birth in Corum Province in Turkey found that the mean LATCH and LATCH subscale scores of the intervention group were higher than those in the control group ($p<0.05$). [17] A cross-sectional, descriptive study also found that in mothers who start to breastfeed their babies within 30 minutes of birth had significantly higher average LATCH scores. [18]

There are limitations to the study. Firstly, the sample technique employed was purposive sampling and study adopted a post-test only control group quasi-experimental design. However, the findings of this study provide evidence and support the recommendations of early initiation of breastfeeding. Promotion of early initiation of breastfeeding as best practice is the need of the hour.

CONCLUSION

This study found that nurse led early initiation of

breastfeeding is helpful in improving LATCH scores, even though it was carried out for a brief period. Since early initiation of breastfeeding is very important for continuation of exclusive breastfeeding, all the health care professionals who provide care to the mother-newborn dyads must put sincere efforts to promote this best practice.

Source of Funding: Self

Conflict of Interest: Nil

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Behavioral Responses to Noise in Preterm Infants Admitted to a Neonatal Intensive Care Unit of a Tertiary Referral Hospital in South India

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ABSTRACT

Background: The preterm infants admitted to a high-tech Neonatal Intensive Care Unit (NICU) are defenseless to the adverse effects of the NICU, especially the noise present in the environment of the NICU.

Aim of the Study: To determine the behavioral responses of preterm infants exposed to noise in the NICU.

Materials and Method: Noise levels in the NICU were measured using calibrated Sound Level Meter (SLM) i.e, Hand Held Analyzer Type 2250, Brüel and Kjær, Denmark. Behavioral responses of the preterm infants were assessed using the 'Behavioral organization of preterm infants' scale.

Results: The present study did not find any major changes in the behavioral responses of preterm infants over a period of seven days. All behavioral responses were normal although the noise levels in the NICU exceeded the recommendations. The maximum hourly equivalent sound L_Aeq of 62.12 $\pm$ 2.24 dB A was found on the 2nd day of the measurement.

Conclusion: Though the study has found that the behavioral responses of preterm infants pertaining to the autonomic system, the motor system, the state system and attention/interaction system were not altered to a major extent, it is important to note that preterm infants are still exposed to noise levels that are exceeding the recommendations. This could probably affect the preterm infants' behavioral responses overtime.

Keywords: *behavioral responses, preterm infants, noise, NICU*

INTRODUCTION

Preterm birth, has assumed the status of world health agenda due to its contribution as a risk factor for at least 50% of the neonatal deaths[1] besides, the 'Global Burden of Disease' analysis highlights preterm birth as a single largest contributor of high mortality and considerable risk of lifelong impairment.[2] Preterm birth mostly mandates Neonatal Intensive Care Unit (NICU) admission. NICU care has contributed to increased survival of these preterm infants, however they are exposed to high-tech environment of the NICU and are susceptible to the adverse effects of the environment of the NICU, especially that of noise, since NICU, like any other intensive care environment is house to life support equipment and other gadgets.

In an editorial, pertaining to the organization of neonatal care in India, [3] it is suggested that the quiet nursery concept founded by Julius Hess as well as Evelyn Lundeen and propagated by Florence Nightingale, the

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founder of modern nursing with components of warmth, rest, quiet, and the like have undergone drastic changes. Today's high-tech nurseries have ventilators, infusion pumps, multi-parameter monitors, and other gadgets surrounding a tiny baby.

Steinschneider, Lipton and Richmond [4] in a study observed neonatal responses in response to noise. The authors reported of observing startle responses among 55% of the neonates in response to 55 dB A stimulus for 2% of the total time, whereas 78% exhibited startle responses to 70 dB A stimulus. It was also found that all the infants exhibited startle response to 85 dB A stimulus for about 25 % of the total time the stimulus was provided. This shows that higher the sound stimulus, increased number of infants exhibited startle responses and these startles were present for a longer duration of time. Wachman and Lahav [5] also suggest that the loud transient NICU noise causes immediate changes in the various systems of the preterm infants.

In this context, Blackburn [6] observes that preterm infants have immature body systems, especially the central nervous system (CNS) organization, so the transition to extra uterine life in an environment like that of a NICU is complex, paving way for several postnatal morbidities and iatrogenic complications. The therapeutic process thus turns out to be detrimental for the preterm infants who are also biologically fragile, predisposing them to various iatrogenic effects of the NICU.

Preterm infants depend on NICU care not only for their continued existence but also for their growth and development. However, the NICU that actually helps them to survive may end up being an inappropriate milieu, given the presence of overwhelming stimuli, most potent among them being the continuous presence of noise caused due to the sophisticated machinery and gadgets. This may adversely affect not only the physiological stability, recovery, growth, development of the preterm infants but also their behavioral responses and subsequently their behavioral organization.

The present study was undertaken to evaluate the noise exposure in preterm infants admitted to a tertiary level NICU and their behavioral responses in relation to the autonomic system, the motor system and the state/attention-interaction system of the preterm infants during measurement of noise.

MATERIALS AND METHOD

An evaluative study was conducted after the ethical approval of the institutional ethical committee (IEC) of Manipal University, Manipal (UEC/14/2011). Proxy informed written consent was obtained from the parent(s) of the preterm infants. The setting of the study was the NICU of a tertiary referral hospital of Udupi district in South India. The tertiary level NICU is a subspecialty of the department of Pediatrics of Kasturba Hospital, Manipal with facilities pertaining to Level III A level of functioning but accredited presently by National Neonatal Forum (NNF) as Level II B. The NICU caters to an average of 940-1045 new admissions per year. Out of these, around 250 to 300 are preterm infants. The preterm infants were chosen to be included in the study if the following inclusion criteria were fulfilled.

Inclusion criteria

Preterm infants who:

- were gestational age of $28^{0/7}$ to $33^{6/7}$ weeks of postmenstrual age (PMA)
- had passed the hearing screening test to confirm hearing ability by Oto-Acoustic Emission (OAE) test
- Parental consent

Exclusion criteria

- Preterm infants who:
- died during the study period
- had major congenital malformations
- had major surgical complications

Behavioral responses of the preterm infants were assessed using the 'Behavioral organization of preterm infants' scale.[7] This instrument was based on the self-regulatory and stress behaviors pertaining to the autonomic visceral system, motor system, state system and the attention/ interaction system as proposed by Als[8] for assessing preterm infant behavior.

Noise levels were measured using a Sound Level Meter (SLM) i.e., the Hand Held Analyzer type 2250, Brüel and Kjær, Denmark calibrated using a Sound Level Calibrator 4231 (Class 1), Brüel and Kjær, Denmark on a weighted frequency A and reported as dB (A). The

noise levels were measured continuously for a period of eight hours for seven days, since the averages taken were representative. A smaller period of assessment would also help to minimize the Hawthorne effect attention bias, [9] where the health care professionals and ancillary staff in the NICU could alter their behavior when they are aware that the study is conducted and avoid any other confounding variables influencing the study. The statistical analyses were conducted with the software IBM SPSS Statistics 20.

RESULTS

The baseline characteristics of the preterm infants are presented in table 1. The data show that majority 20 (66.67%) of the preterm infants were males, belonged to PMA of $28^{0/7}$ to $30^{6/7}$ i.e., 17 (56.67%), 22 (73.33%) were AGA, 28 (93.33%) were singleton and 23 (76.67%) were intramural births. The mean weight in grams and standard deviation was 1194 ± 204 g and majority 17(56.67%) of the preterm infants admitted to the NICU during the period of data collection were Very Low Birth Weight (VLBW) infants.

Table 1: Baseline characteristics of preterm infants at inclusion (N=30)

		f	%
1	Gender		
	Male	20	66.67
	Female	10	33.33
2	PMA (in weeks)		
	$28^{0/7}$ to $30^{6/7}$	17	56.67
	$31^{0/7}$ to $33^{6/7}$	13	43.33
3	Auxological criteria - 'Weight-for-GA'		
	Small for Gestational Age (SGA)	8	26.67
	Appropriate for Gestational Age (AGA)	22	73.33
4	Birth Order		
	Singleton	28	93.33
	Twins	2	6.67
5	Birth place		
	Intramural births	23	76.67
	Extramural births	7	23.33
6	Low Birth Weight - LBW status (mean weight in g ± SD)	1194 ± 204	
	Extremely Low Birth Weight (ELBW)	7	23.33
	Very Low Birth Weight (VLBW)	17	56.67
	Low Birth Weight (LBW)	6	20.00

The noise levels in the NICU for a period of eight hours were measured continuously using the SLM. Timed measurements, yielded the maximum hourly equivalent sound i.e., the $L_A eq$, which is expressed in dB A. The $L_A eq$ and the standard deviations are described in table 2, which shows that $L_A eq$ of 62.12 ± 2.24 dB A was detected on the

2nd day of the measurement. Whereas the lowest $L_A$eq was recorded on the 4th day, which was 59.4 ± 1.08 dB A.

Table 2: $L_A$eq of the acute NICU during the period of measurement

$L_A$eq (dBA)	Mean ± SD
First day of measurement	59.6 ± 1.88 dBA
Second day of measurement	62.12 ± 2.24 dBA
Third day of measurement	61.8 ± 2.12 dBA
Fourth day of measurement	59.4 ± 1.08 dBA
Fifth day of measurement	59.57± 1.20 dBA
Sixth day of measurement	61.89± 2.36 dBA
Seventh day of measurement	59.87± 1.76 dBA

Behavioral responses of preterm infants during the measurement of noise levels

The tool that measured the behavioral responses of preterm infants during the measurement of noise levels was the 'Behavioral organization of preterm infants' scale. The instrument was constructed as a categorical scale with rubrics for scoring each domain clustered under the three systems namely the autonomic/visceral system, the motor system and the state and attention-interaction system. The tool has a point system scoring, with scores ranging from zero to three for the four domains in the autonomic system, scores from zero to two for the motor system having two domains and the state system and attention/interaction system had three domains with progression of scores ranging from zero to four. The total scores obtained for each system were further classified as scores suggesting normal, suspicious and abnormal behavioral organization of the preterm infants. The behavioral responses of the preterm infants pertaining to the autonomic system, the motor system, the state and the attention/interaction system during the period of measurement of noise levels. All measurements were done during the morning (9-10 am), which was deemed as the noisiest time of an average day. The data is presented in table 3 as median values and the subsequent Inter-Quartile Range (IQR).

Table 3: Behavioral responses of preterm infants during the days of measurement of noise (N=30)

Behavioral responses of preterm infants	Autonomic system Median(IQR)	Motor system Median(IQR)	State/attention-interaction system Median(IQR)
First day of measurement	10 (9-10)	3(3-4)	10(11-12)
Second day of measurement	11(10-12)	3(3-4)	8(7-8)
Third day of measurement	11(10-12)	4(4-5)	9(9-10)
Fourth day of measurement	10(9-11)	3(3-5)	10(10-11)
Fifth day of measurement	11(10-12)	3(3-5)	10(10-11)
Sixth day of measurement	11(10-12)	4(4-6)	10(10-12)
Seventh day of measurement	11(10-12)	4(4-6)	10(9-11)

The data presented in table 3 show that the behavioral responses were within the normal behavioral organization of preterm infants in all the three subsystems namely the autonomic system, the motor system and the state/attention-interaction system throughout the days of measurement. However, there was a slight decrease in the scores on the second day M (IQR) - 8(7-8) and the third day of measurement M (IQR) - 9(9-10) in the state/attention-interaction system. However, these measurements were within the purview of normal behavioral responses of preterm infants. None of the behavioral responses of the preterm infants were categorized as suspicious and abnormal behavioral organization of the preterm infants.

DISCUSSION

The study provides evidence that the sound levels in the NICU exceed the standard recommendations of permissible hourly L_{Aeq} for nurseries. [11] This finding is in line with findings of several studies conducted to assess the noise levels in the NICU. [12-15]

The present study also found the behavioral responses of preterm infants exposed to noise. However, a study[4] found that startle responses were observed among 55% of the neonates in response to 55 dB A noise for 2% of the total time, and 78% of the neonates exhibited startle responses to 70 dB A stimulus. It was also found that all the infants exhibited startle responses to 85 dB A stimulus for about 25 % of the total time the stimulus was provided. Another study carried out by Miller and Byrne [10] that assessed the effect of sound stimulus over the ambient background noise also found results that are not in line with the present study findings. The researchers had found the ambient background noise to be 58 dB A. The results of the study demonstrated that when the term newborns who were in 'deep sleep' state when they were observed, woke up to pure tones of 70 dB to 75 dB presented to them. This study demonstrated that loud sound causes change in behavior of infants.

The present study did not find any major changes in the behavioral responses of preterm infants over a period of seven days. None of the measurements suggested any suspicious or abnormal behavioral organization in the observed preterm infants. Though startle responses were observed occasionally during the period of measurement, there were not significant and occurred for a brief period. One of the limitation of the study could be attributed to the timing of measurement of behavioral responses. The behavioral responses were measured for only one hour per day only in the morning, however the noise measurements were averaged for a period of eight hours per day. This could also contribute to measurement bias. Another limitation of this study could be related to observer bias since the assessors of behavioral responses were not blinded.

CONCLUSION

Though the study has found that the behavioral responses of preterm infants pertaining to the autonomic system, the motor system, the state system and attention/interaction system did not show any suspicious or abnormal behavioral organization in preterm infants in response to noise, it is pertinent to note that the study has found that the noise levels exceed the recommendations. This could probably affect the preterm infants behavioral responses overtime. A more rigorous study is required to determine whether the behavioral responses differed in response to the noise levels existing in the environment of the NICU.

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Infection Control Risk Assesment Tuberculosis on Children based Area in the City of Banjarbaru

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ABSTRACT

The child TB rate is 8.8% out of 3,153 cases, the incidence of child TB in South Kalimantan is 241 cases / year. TB on child data in South Kalimantan Province from 2009-2011 found as many 28 cases with smear + age 0-14 years. In 2014 and 2015, the proportion of tuberculosis patients found in Banjarbaru City was 10.84% and 8.5% compared to all TB patients. To get the results of the work of TB disease control is high it is necessary integration from planning to preparation of financing priorities one of the control systems of infection control infection measured that is ICRA (Infection Control Risk Assessment). ICRA is an important tool in developing planning, development, monitoring, evaluation and efforts to make consideration of the various stages and levels of risk of TB infection. This research is a descriptive study with ecological approach, to describe the condition of TB children in Banjarbaru City, South Kalimantan Province. The populations of the research are children with TB who were recorded and reported to the person in charge of TB program of Banjarbaru City Health Office. The sample of this research is all child tuberculosis patients in Puskesmas in Banjarbaru City area from January to December 2015.

Keyword: *TB on Children, ICRA*

INTRODUCTION

Tuberculosis (TB) in the world continues to increase, especially countries grouped in 22 countries with high burden countries so that 1993 WHO proclaimed TB one of the global emergency and as a disease of emerging diseases. Indonesia ranks fourth after India (2.0 million-2.5 million), China (0.9 million-1.1 million), South Africa (0.40 million - 0.6 million) and Indonesia at 0.4 million-0.5 million cases, 155-222 cases/100,000 population/year[1].

The discovery of TB cases in Indonesia still has not received adequate attention. This is reflected in the surveillance system that has not been able to obtain data on actual child TB, as not all treated cases are recorded in the Health Office and the quality of the diagnosis is questionable. The child TB rate is 8.8% out of 3,153 cases, the incidence of child TB in South Kalimantan is 241 cases / year. TB on children data in South Kalimantan Province from 2009-2011 found as many 28 cases with smear + age 0-14 years. In 2014 and 2015, the proportion of TB patients found in Banjarbaru City was 10.84% and 8.5% compared to all TB patients[2].

Survey results in Kota Banjarmasin (neighboring Banjarbaru City), only 28.6% reported TB cases handled to TB program managers in the Health Office (Mahendradhata et al., 2012). Integrated efforts to overcome or break the chain of transmission of TB disease should consider the risk factors for TB disease. Risk factors closely related to TB incidence / incidence are population factors. To get the results of the work of TB disease control is high then the necessary integration from planning to preparing financing priorities (Achmadi, 2008). One of the control system of infection control that measured is ICRA (Infection Control Risk Assessment). ICRA is an important tool in developing planning, development, monitoring, evaluation and efforts to make consideration of the various stages and levels of risk of TB infection[3].

MATERIALS AND METHOD

This research is a descriptive study with ecological approach, to describe child TB condition. The study population was children with TB. The sample of this research is all child tuberculosis patient in Puskesmas in

Banjarbaru City area from January to December 2015. The research variables are management of case characteristic of child tuberculosis disease (gender, age, BCG status, nutritional status), physical house environmental risk factors house temperature, air humidity, lighting, home floor type and occupancy density), prevention of TB child infection and management of antibiotic resistance in the treatment of child tuberculosis in Banjarbaru City.

FINDINGS

Table 1: Results of univariate analysis

Variabel	**Case**		**Control**			
	N	**(%)**	**N**	**(%)**	**N**	**(%)**
Gender						
Male	12	54,5	8	36,4	20	45,5
Female	10	45,5	14	63,6	24	54,5
Age						
Toddler (<5 year old)	3	13,6	6	27,3	9	20,5
Not a toddler (≥5 years old)	8	36,4	11	50,0	19	43,2
BCG Immunization Status						
Yes	11	50,0	5	22,7	16	36,4
No	16	72,7	1	4,5	17	38,6
Temperature						
Not Suitable	6	27,3	21	95,5	27	61,4
Suitable	22	100	20	90,9	42	95,5
Humidity						
Not Suitable	-		2	9,1	2	4,5
Suitable	21	95,5	21	95,5	42	95,5
Ilumination						
Not Suitable	1	4,5	1	4,5	2	4,5
Suitable	20	90,9	19	86,4	39	88,6
Length of Ventilation						
Not Suitable	2	9,1	3	13,6	5	11,4
Suitable	5	22,7	7	31,8	12	27,3
Type of Floor						
Wood floor	17	77,3	15	68,2	32	72,7
Cement Floor	6	27,3	10	45,7	16	36,3
Ceramics Floor	4	18,2	1	4,3	5	11,4
Length of floor						
Not Suitable	12	54,5	11	50	23	52,3
Suitable	5	22,7	14	63,6	18	40,9
Density of House						
Not Suitable	17	77,3	8	36,4	26	59,1
Suitable	5	22,7	14	63,6	18	40,9

Based on Table 1 it is known that in the gender variables, those who suffer from TB disease in children are mostly male (54.5%) from 22 respondents who suffer from tuberculosis.

In this study it is known that variabel age, who suffer from TB disease big age of as many as 11 respondents (50.0%) from 22 respondents who suffer from tuberculosis.

Based on the above table, it is known that the distribution frequency of tuberculosis patients has mostly

received BCG immunization, from 22 respondents who suffer from pulmonary tuberculosis, 16 respondents (72.7%) have received BGC immunization.

Based on temperature variables, it is known that pulmonary tuberculosis patients are more found in environment with inappropriate temperature that is 22 respondents (100%) of total tuberculosis suffer as much as 22 respondents.

Based on the humidity variables, it is known that most respondents who suffer from tuberculosis disease have environment that is not appropriate with health humidity, that is 21 respondents (95.5%) of total TB suffer as much 22 respondents.

Based on standard of illumination, TB patients are more commonly found in those who have a house with illumination that is not in accordance with health standard, that is 20 respondents (90.9%) of total tuberculosis suffer as much as 22 respondents.

Based on the wide variables of ventilation, it is known that from the findings in the field, most of those who suffer from tuberculosis disease have the width of home ventilation according to health standard, that is 17 respondents (77.3%). Nevertheless, in this study found as many as 5 respondents (22.7%) who have a house ventilation area is not in accordance with health standards.

Based on the results of this study, it is known that from the variables of the floor type of the house, most of those who suffer from pulmonary tuberculosis have a ceramic floored house, that is 12 respondents (54.5%), however, in the findings of the field also found many tuberculosis patients with type of floor of board house, that is 6 (27,3%).

Based on the variable floor of the house, it is known that most tuberculosis patients have floor area not in accordance with health standards, as many as 5 respondents (22.7%). Based on the variable of house density, it is known that from 22 respondents who suffer from tuberculosis disease, as many as 17 respondents (77.3%) have appropriate occupancy density, and as many as 5 respondents (22.7%) others have unhygienic occupancy density.

Efforts to Prevent the Spread of tuberculosis Infection in Children with tuberculosis *Children (Cases)*

Overall, efforts to prevent the spread of child tuberculosis infections in child tuberculosis patients are mostly enough as much as 90.9 percent.

Table 2: Efforts to Prevent the Spread of tuberculosis Infection in Children with TB Children (Cases)

Variable	Case	
	N	(%)
Good	2	9.1
Enough	20	90.9
Total	**22**	**100**

Management of Antibiotic Resistance in Child Tuberculosis Treatment

Table 2: Antibiotic Resistance Management Efforts on the Treatment of Child Tuberculosis Patients

Variable	Case	
	N	(%)
Good	17	77.27
Enough	2	9.09
Less	3	13.63
Total	**22**	**100**

Overall, efforts to manage antibiotic resistance to tuberculosis treatment are mostly good as much as 77.27 percent.

DISCUSSION

Based on Table 1 it is known that in the gender variables, those who suffer from TB disease in children are mostly male.

According to the Islamiyati study tend to be more in girls, the ratio is 1: 4 (male: female) because in boys the portion is larger so it tends to have better nutritional status which enables better defense against illness. 17 , 19.22

In this study it is known that age variable, who suffer from tuberculosis disease big age of as many ≥5 years old[5].

Based on the above table, it is known that the distribution frequency of tuberculosis patients has mostly

received BCG immunization, from 22 respondents who suffer from pulmonary tuberculosis, 50.0 percent have received BGC immunization.

The result of statistical test shows that BCG immunization status (sig.0,001) gives a real effect to the incidence of pulmonary tuberculosis in children.

Immunization is a deliberate attempt to provide immunity (immunity) in infants or children to avoid disease. Immunization is also a very effective primary prevention effort to avoid infectious diseases. Thus, the incidence of infectious diseases will decrease, disability and death will be reduced.12 BCG immunization is part of the immunization factors analyzed to predict the incidence of pulmonary TB in children. BCG immunization protects children from TB meningitis and miliary TB with a protective degree of approximately 86%[6].

The environmental conditions of house includes temperature, humidity, illumination, wide house ventilation, floor area of the house and density of occupants. From this study it is known that tuberculosis patients are more commonly found in those who have homes with illumination that are inconsistent with healthy home standards of 90.9 percent.

The condition of home ventilation in respondents suffering from tuberculosis disease has wide ventilation according to health standard of 77.3 percent. However, the temperature and humidity conditions inside the house are largely unqualified. The floor area of the house and the density of the occupants are eligible at 77.3 percent

According to Gould and Brooker (2003), Mycobacterium tuberculosa bacteria has the preferred temperature range, but in this temperature range there is an optimum temperature that allows them to grow rapidly. Mycobacterium tuberculosa is a mesophilic bacteria that thrives in the range 25 - 40º C, but will grow optimally at 31-37ºC[7].

If the condition of air humidity in the room> 70% it will facilitate the breeding of microorganisms one of which is mycobakterium tuberculosis[7].

The condition of the room is related to the incidence of pulmonary tuberculosis where people with unqualified room conditions have a chance of 1.18 times for contracting pulmonary TB compared to a house with a qualified room condition. Condition of the room is eligible if ventilation is available> 10% floor area, windows are opened every day, lighting is good enough in the bedroom, kitchen or living room. Houses with good lighting and ventilation will complicate the growth of germs, because ultraviolet light can kill germs and good ventilation causes air exchange, thus reducing the concentration of germs. Unhealthy sources of illness have a 1.8 times greater risk of TB than those using healthy light[7,8].

Based on the wide variables of ventilation, it is known that from the findings in the field, most of those who suffer from TB disease have the width of home ventilation according to health standard.

Ahmad Dahlan (2001) study showed that houses with ventilation of <10% of the floor area had a chance of having TB 4.56 times compared with those with ventilation> 10% of floor area. According to Azwar (1995) ventilation serves to free the air from tuberculosis bacteria. Wide ventilation that does not meet the health requirements will result in blocking the process of air exchange and sunlight into the home as a result of tuberculosis germs that are in the house can not come out and participate inhaled with air respiration[9,10].

Based on the results of this study, it is known that from the variables of floor type of house, most of them who suffer from pulmonary tuberculosis have ceramic floored house, that is 12 respondents (54,5%), however, with type of floor of board house, that is 6 (27,3%).

According to research by Ariza Adnani and Asih Mahastuti (2003-2006) in Iskandar (2010) in Southeast Aceh District, the floor of the house is a risk factor for pulmonary tuberculosis disease, the risk to suffer from pulmonary tuberculosis is 3-4 times higher in people living at home whose floors do not meet health requirements.10 Based on the variable floor of the house, it is known that most tuberculosis patients have floor area not in accordance with health standards, as many as 12 respondents (54.5%).

The result of statistic test showed that the floor area of house and house density (sig 0,37) gave a real effect to the incidence of pulmonary tuberculosis in children.

The density of the dwelling is related to the breadth of the house floor which must be adjusted to the number of occupants so as not to cause overload. this is done

to minimize the contact of transmission of pulmonary tuberculosis disease to family members. Because the more dense the number of occupants the faster the transmission occurs[11].

According to Ginanjar (2008), the floor area of a healthy house building should be enough for the occupants in it. That is, the floor area of the building must be adjusted with the number of occupants. Building area that is not proportional to the number of occupants will cause the overcrowded.

CONCLUSION

1. Tuberculosis disease in children are mostly male.

2. More TB disease in under five years old

3. Tuberculosis disease occurs more often at home conditions that are not in accordance with health standards

Ethical Clearance: This study approved and received ethical clearance from the Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia. In this study we followed the guidelines from the Committee of Public Health Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia for etchical clearance and informed consent. The informed consent included the research tittle, purpose, participants's right, confidentiality and signature.

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