



National Journal of Research in Community Medicine *of India*

ISSN: 2277-1522 (Print) ; 2277-3517 (Online)

An Official Publication of Community Medicine
Faculties Association



Volume 7. Issue 3. Jul.-Sep.2018 (156-241)

Indexed in Index Copernicus & Other database

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30.09.2018

National Journal of Research in Community Medicine (NJRCM)



Volume 7. Issue 3. Jul.-Sep.2018 (156-241)

**Community Medicine Faculties Association
Chennai
India**



NJRCM- Volume 7. Issue 3. Jul.-Sep.2018 (156-241)

National Journal of Research in Community Medicine
ISSN - Print: 2277 – 1522, Online: 2277 – 3517

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value:64.29 and other data base.

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Internship in Community Medicine: Challenges and the Way Ahead**Donald S. Christian¹, Purushottam A. Giri²****Affiliation:**¹Assistant Professor, Department of Community Medicine, GCS Medical College, Ahmadabad, Gujarat, India²Professor & Head, Department of Community Medicine, IIMSR Medical College, Badnapur, Jalna, Maharashtra, India**Date of Submission** : 01-04-2018**Date of online Publication** : 07-07-2018**Date of Acceptance** : 18-06-2018**Date of Print Publication** : 30-09-2018***Author for correspondence:** Dr. Purushottam A. Giri, Professor & Head, Department of Community Medicine, IIMSR Medical College, Badnapur, Jalna, Maharashtra, India. E-mail: drpgiri14@gmail.com**Dear Sir,**

Internship, a transition from a medical student to a doctor, is a period of one year after passing the final year exam of MBBS, where an intern works in various departments in a hospital. The medical education system in India is one of the largest in the world. It has a five and half year curriculum with the three-phase framework of pre-clinical (12 months), para-clinical (18 months) and clinical (24 months), plus an internship (12 months). Interns are expected to assume significant responsibility for patients care during their clinical postings, including being able to confidently communicate with patients and their family members.^[1]

The Medical Council of India describes internship as “a phase of training wherein a graduate is expected to conduct actual practice of medical and health care and acquire skills under supervision so that he/she may become capable of functioning independently”^[2]

Over the past three decades, Community Medicine has emerged as an important discipline in medical science across the Indian Medical Education. The Medical Council of India has recognized the importance and the prospects of the subject in more contemporary way. The necessity of the exposure to community as well as public health at large is foreseen by the council to make a medical graduate complete.^[2] The knowledge and skills required by the basic medical graduate comes not only from the clinical skills but also the managerial skills that is needed to run a health department/clinic or a public health center (Primary Health Center). Though many of the theoretical concepts are taught during the undergraduate teaching, imparting the applications of the concepts of primary health care as well as the community health care are required during the internship phase.^[3] Some of the institutions are also asking on scoring of the skills learned during the internship programs. The focus of the internship is to overcome the insufficient experience as well as to raise the morale of the fresh medical graduates who might be having only the theoretical knowledge.^[4]

The focus of the internship training thus holds so much during the 2 months rotation in the Community Medicine department. The specific objectives of the internship training program have been defined by the Medical Council of India for each speciality. For example, Preparation of ORS, morbidity survey proforma, dietary advice, health check up, tabulation and presentation of had given data, health education, immunization and cold chain maintainance etc. These are the criteria set by MCI for the 2 months of internship in Community Medicine Department. It asks every intern to have a posting at both Rural and Urban Health Training Centers.

The objectives of the internship at Community Medicine/RHTC/UHTC/PHC could be summarized as below:

- ❖ To provide preventive, promotive, curative and rehabilitative service to rural / urban population.
- ❖ To acquire competence in diagnosis and treatment of medical conditions like malaria, tuberculosis, hepatitis, meningitis etc. in the relevant set up.
- ❖ To acquire proficiency for Family Welfare Programs (antenatal care, normal delivery, contraception care etc.)
- ❖ To implement National Health Programs in Rural / Urban field practice area.
- ❖ To prepare and implement the short term research projects in the community.
- ❖ To initiate or participate in family composite health care (birth to death), Inventory of events;
- ❖ Participation in all of the modules on field practice for community health e.g. safe motherhood, nutrition surveillance and rehabilitation, diarrhea disorders etc.

The common activities done to achieve these objectives are through diagnosis and treatment of common ailments, promoting RCH services, involvement in school health programs, involvement in advocacy through various health programs and observance of national health days.

Challenges:

Despite of the constant emphasis on the objectives, the interns posted often lack the required commitment to the postings. The following reasons could be listed for the possible shortfall in terms of the active involvement:-

- ❖ Inconsistent formulations, supervision and monitoring of the activities by the faculty/staff of the department/college.^[5,6]
- ❖ Lack of interest of the respective Medical Officer posted at the health center as they often consider it as “unpaid additional work” not the part of their regular duties.^[6]
- ❖ Inadequate willingness and motivation to reach out for the respective field areas and health centers by the interns. (Transportation relies on the interns by and large)^[5]
- ❖ Much focus on alternate issues such as preparation of competitive examinations and attending coaching classes.^[5,6]
- ❖ Not able to identify the timeframe for achieving the objectives with proper plan.^[7]
- ❖ Not able to identify the practicality of the opportunity to learn public health management and health systems.^[7,8]

Possible Solutions:

- ❖ Adequate orientation on the core objectives of the internship training for both interns as well as the field staff.
- ❖ Optimal liaison with the in-charge / officers of health centers so that they cooperate in achieving objectives.
- ❖ Periodic physical verification of the attendance records into field areas.
- ❖ Adequate recognition with awards/certificate/incentives to provide motivations for activities performed.
- ❖ Brain-storming and training of the staff for teaching and training interns.
- ❖ Identifying specific skills and working out feasible plans to achieve the same with checklists and logbooks.
- ❖ Knowledge sharing, problem analysis and feedbacks through combined meetings of department and field staff on periodic basis.

Here, the main aim of internship is to gain clinical experience and expertise and not to pass entrance exams. Finally, internship is the most important period of the medical career, it is the year when the fresh minds are moulded and prepared to enter the world of healers.

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Conflict of Interest: None

Source of funding support: Nil

How to cite this article: Christian DS, Giri PA. Internship in Community Medicine: Challenges and the Way Ahead. *Nat J Res Community Med* 2018;7(3): 156-157.

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NJRCM: www.commedjournal.in



ORIGINAL RESEARCH ARTICLE

DOI: 10.26727/NJRCM.2018.7.3.158-162

Year: 2018 Vol: 7 Issue: 3. Jul.-Sep. Page: 158-162

A study on Infant and young child feeding practices among children aged less than 24 months in an Urban slum of Raichur – A cross-sectional study.

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Date of Submission : 26-05-2018

Date of online Publication : 07-07-2018

Date of Acceptance : 13-06-2018

Date of Print Publication : 30-06-2018

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ABSTRACT

Introduction: After the age of six months the nutritional requirement of the child will no longer be met with breast milk alone. Timely introduction of solid and semisolid foods, appropriate quantity and quality is very essential failing which, risk of malnutrition increases. Therefore the present study was taken up with the objective of assessing the infant and young child feeding practices of children less than 24 months. **Materials and methods:** This cross sectional study was conducted in the urban field practice area of a medical college in Raichur, Karnataka. Based on DLHS 4 data on proportion of children under 6 months who were exclusively breast fed, a sample size of 171 was obtained. A pretested semi structured questionnaire was framed based on WHO IYCF questionnaire to collect data. **Results:** Mothers of 178 children were included in the study. Proportion of male and female children exclusively breast fed were 45% and 55% respectively. Colostrum was discarded by 19.4% mothers and amongst them 11.3% perceived it to be dirty. Minimum acceptable diet (MAD) requirement was met only in 12.4% of the children. **Conclusion:** Inappropriate infant and young child feeding practices are highly prevalent. A minimum acceptable diet criterion according to the WHO recommendation was met only in 1/8th of the study population. There is a need to create awareness on the importance of proper feeding practices in the community to improve the nutritional status of the under-five population.

Key-words: Infant and young child feeding (IYCF), Breast feeding, complementary feeding.

INTRODUCTION

First two years of life is crucial in a child's development, where optimal infant and young child feeding ensures growth and impacts survival.^{1, 2} Even mild or moderate under nutrition during this period can cause irreversible damage.³ Early initiation of breast feeding, exclusive breastfeeding for the first six months and continued breastfeeding for two years and beyond significantly reduces childhood malnutrition.^{4,5, 6,7} Early initiation of breast feeding provides many immune-competent factors, which gets disturbed by introducing pre-lacteal feeds and partial breast feeding.⁸ After 6 months, solid and semi-solid foods need to be introduced along with continued breast feeding to meet the increasing nutritional requirements of the growing infant.⁹

MATERIALS AND METHODS

This cross-sectional study was conducted in the urban field practice area (an urban slum) of a medical college in Raichur district, Karnataka. The study was carried out for a duration of six months from October 2017 to March 2018. As per the findings of DLHS 4, in Raichur district, the proportion of children who were found to be exclusively breast fed for at least six months was 19.6%.¹³ Based on this prevalence, the sample size was estimated

According to NFHS 4, infants below six months who are exclusively breast fed and children aged 6 to 23 months receiving an adequate diet is 54.9% and 20.9 % respectively. While, in Karnataka it is 54.2 and 22.6% respectively.¹⁰ About 19% of all under five deaths can be prevented by optimal infant and young child feeding. Hence, World Health Organisation (WHO) and UNICEF recommended few core indicators to assess IYCF.^{3,11,12}

Data on IYCF from urban slums of northern Karnataka are meagre, in the light of this the present study was undertaken to assess the IYCF practices and their determinants among children aged less than 24 months in an urban slum of Raichur, Karnataka.

to be 158 at 90% confidence interval using Epi Info online sample size calculator. Considering a nonresponse rate of 10%, a sample size of 174 was reached. There were 17 anganwadis in the field practice area. Data was collected from at least 10 children from each anganwadi. A total of 178 children less than 24 months of age were studied in this research project. The children were randomly selected from the list that was obtained from the

anganwadi centres. Permission to conduct the study was obtained from the institution's ethical committee. Data was obtained by face to face interviews from the mothers of the children after obtaining informed consent. A pretested semi structured questionnaire was framed according to the WHO IYCF questionnaire. The questionnaire consisted of two parts, the first part consisted of questions on socio-demographic variables and the second part consisted of questions on breastfeeding and infant and young child feeding practices.

Seven core indicators and one optional indicator (bottle feeding) were included in the questionnaire as per the guidelines of WHO. Based on the guidelines, information was collected about the child's feeding practices in the previous 24 hours, this comprised of questions on the type of food items fed to the child and the number of times in a day they were fed. Food items were categorized in seven types, that is, cereals, legumes and nuts, dairy products, meat products, egg, vitamin A rich fruits and vegetables, and other fruit and vegetables.¹⁴

Definitions used:¹⁴

Minimum diet diversity (MDD): Proportion of children in the age group of 6-23 months who were fed foods of four or more groups from a total of seven food groups, namely, dairy products, legumes and nuts, flesh foods, eggs, vitamin A rich fruits and vegetables, cereals and tubers, and other fruits and vegetables.

Minimum meal frequency (MMF): is the proportion of breastfed and non-breastfed children aged 6-23 months who receive solid, semi-solid, or soft foods (but also including milk feeds for non-breastfed children) the minimum number of times or more i.e., two times if 6-8 months and three times if 9-23 months for breast fed children and four times for all children aged 6-23 months among non-breast fed children.

Minimum acceptable diet (MAD): is the proportion of children aged 6-23 months who receive at least the MDD as well as at least the MMF according to the definitions mentioned above¹⁴

Data was entered in Microsoft excel 2010 and analysed using Microsoft excel, SPSS version 16 and Epi Info 7. The results were expressed as percentages and proportions. Chi square test was used to test the association between variables. A p value of less than 0.05 was considered as statistically significant.

RESULTS

A total of 178 mothers were interviewed about the feeding practices of their infants and young children under 24 months of age. About 32.6% of children were males and 67.4% were females. About 68.5% mothers were literates, of whom 14.6% had a graduate degree, 83.7% of them were homemakers by occupation. Majority (65%) of the population belonged to lower socio economic status according to Modified B.G. Prasad classification. Half of the study participants (50.6%) belonged to joint families and about 65.2% of mothers said there are more than 5 members in their family.

Table 1: Status of Infant and young child feeding practices according to sex

	Status	Male N (%)	Female N (%)	Total N (%)	Chi square (p value)
Exclusive breast feeding among 0-6months(n=41)	Yes	9 (45)	11(55)	20 (100)	3.186 (0.07)
	No	4(19)	17(81)	21(100)	
Early initiation of breast feeding (less than 1 hour) (n=178)	Yes	30(24.6)	92(75.4)	122 (100)	11.21 (0.001)
	No	28(50)	28(50)	56 (100)	
Continued breast feeding : 12 months to 15 month (n=22)	Yes	10(62.5)	6(37.5)	16 (100)	1.49 (0.2)
	No	2(33.3)	4(66.7)	6 (100)	
Introduction of semisolid foods (6-8 months) (n=27)	Yes	0	7(100)	7 (100)	8.77 (0.03)
	No	13(65)	7(35)	20 (100)	
*Minimum diet diversity -6 months to 24 months (n=137)	Yes	7(30.4)	16(69.6)	23 (100)	0.73 (0.78)
	No	38(33.3)	76(66.7)	114 (100)	
†Minimum meal frequency 6 to 24 months (137)	Yes	22(26.5)	61(73.5)	83 (100)	3.83 (0.05)
	No	23(42.6)	31(57.4)	54 (100)	
‡Minimum acceptable diet 6-24 months (137)	Yes	4(23.5)	13(76.5)	17 (100)	0.764 (0.38)
	No	41(34.2)	79(65.8)	120 (100)	
Bottle feeding	Yes	9(33.3)	18(66.7)	27 (100)	0.008 (0.92)
	No	49(32.5)	102(67.5)	151(100)	

Table 2: Association of exclusive breast feeding and minimum adequate feeding with the socio- demographic variables

Variables	EBF (infants 0-6 months)		P value	MAD (6 to 24 months)		P value
	Yes(%)	No(%)		Yes(%)	No(%)	
Socio economic status						
Upper	4 (19)	3 (15)	0.7	9 (7.5)	14 (82.4)	0.001†
Lower	17 (81)	17 (85)		111(92.5)	3(17.6)	
Mother's education						
Illiterate	4 (19)	4 (20)	0.939	38(31.7)	0	0.007†
Literate	17 (81)	16 (80)		82(68.3)	17(100)	
Mother's occupation						
Home makers/ Unemployed	18 (85.7)	20 (100)	0.12	94 (78.3)	17(100)	0.02†
Employed	3 (14.3)	0 (0)		26 (21.7)	0	
Order of the child						
≤2	18 (85.7)	17 (85)	0.95	76(63.3)	13(76.5)	1.129
>2	3 (14.3)	3 (15)		44(36.7)	4(23.5)	0.288
Type of family						
Joint	17 (81)	7 (35)	8.9 *	56(46.7)	10(58.8)	0.88
Nuclear	4 (19)	13 (65)	0.003	64(53.3)	7(41.2)	0.348
Number of occupants in the family						
≤4	4 (19)	16 (80)	15.32 *	39(32.5)	3(17.6)	1.54
≥ 5	17 (81)	4 (20)	0	81(67.5)	14(82.4)	0.214

*chi square, †Mid p exact

Majority of the mothers (69.1%) were aware of the correct duration of exclusively breast feeding as six months, while 5.6% mothers thought it to be four months. Responses given by the mothers when asked about the duration of continued breast feeding were until one year (19.1%), two years (38.8%) and as long as the child wants (36.5%). Majority of the (87.6%) of the mothers were aware about colostrum to be given to the infants.

Colostrum was not given to 19.7% of the children at birth. Among the mothers who had not fed colostrum to their children at birth, 65.7% perceived it to be dirty and not healthy for their babies and the rest of them (34.3%) were not aware about colostrum. They practiced discarding the first milk as per the advice of the elders in the family. About 32% of the mothers had given pre-lacteal feeds to the infants.

Practice of Infant and young child feeding is presented in Table 1. About 48.8% of the infants less than six months were given exclusive breast feeding. About 68.5% of the infants were initiated on breast feeding within one hour of birth, among these infants 75.4 % were female and 24.6% were male, this difference was found to be statistically significant ($p < 0.01$). Among infants aged 6 to 8 months ($n=27$), only the female infants were introduced with semi solid foods at 6 to 8 months of age, this difference in the gender and introduction of semi-solid foods was found to be statistically significant ($p < 0.05$). About 12.4% of infants and young children aged 6 to 24 months had received minimum acceptable diet.

Association of exclusive breast feeding and minimum acceptable diet with socio demographic variables is presented in Table 2. Type of family and number of occupants in the house were found to be significantly associated with the practice of exclusive breast feeding ($p < 0.005$ and $p < 0.01$ respectively). Mother's education and occupation was found to be statistically significant with minimum acceptable diet (MAD) of the children with p value < 0.05 .

DISCUSSION

In the present study 68.5 % of the children were breast fed within one hour which is better than the findings of National Family Health Survey 4 (NFHS-4) for Karnataka (56.4 %).¹⁰ A study carried out by Das N et al showed comparatively lower proportion of children (34.2%) initiated on breastfeeding within one hour of birth.¹⁵ It is recommended to initiate breastfeeding immediately after birth, preferably within the first 30 minutes.¹⁶

A study by Agarwal et al reported that 20.5% of children had been given pre-lacteal feeds.¹⁷ A study by Davalgi et al showed that 9% of the mothers, despite being educated had given pre-lacteal feeds to the newborns. The most commonly given pre-lacteal feeds were found to be honey and water. Their study reported that only 39% of children were initiated on breastfeeding within one hour of birth, which is low when compared to the findings of our study.¹⁸ In our study, a higher proportion of (32%)

mothers or caregivers used jiggery/sugar water, honey, castor oil as pre-lacteal feeds based on the suggestion of the elders in the family. Giving pre-lacteal feeds is prevalent across the country. In a study carried out by Nawaz A.S et al in Rural areas of Raichur, 71.2% of infants were given colostrum at birth, which is comparatively lower than the findings of our study, while 12.4% mothers had given honey and jiggery water as pre-lacteal feed, 2.8% had given honey and 13.6% of infants were breastfed by other lactating women (wet nursing), but not by their mothers; hence being devoid of the protective colostrum.¹⁹ The mothers were told by elders in the family to refrain from breastfeeding the infant for the first three days as they perceived the milk is dirty, because of its yellow colour. Castor oil is often used as pre-lacteal feeds by the mothers/ caregivers as they think it acts as a purgative. These practices are not only unnecessary but also harmful for the new born. The pre-lacteal feeds given and the beliefs associated with them vary based on the religion, local customs and also vary in different areas.

Though 69% of the mothers were aware of the duration of exclusive breast feeding (EBF) only 48.8% of them had actually exclusively breast fed their children which was lesser when compared to NFHS 4 data in the state (54.2%) and various other studies.^{12,20,21} Kalita et al in their study showed that exclusive breast feeding was found to be more among the mothers who were better educated, those who had received four or more numbers of ANC visits, primipara mothers, mothers in younger age group and those belonging to lower socioeconomic status.²¹ In contrary to the findings by Kalita et al, Veghari G et al showed that multiparous women are more likely to exclusively breastfeed their infants, the practice of EBF showing increase with the higher birth order.²²

Our study found statistical significant association with type of family and number of occupants in the family and exclusive breast feeding. Practice of Exclusive Breast Feeding was found to be better in nuclear families and in families with less than four residents. Similar observations were made in other studies with larger family size.^{22,23,24} We can conclude from these findings that in joint families the suggestions made by the elders based on the customs, rituals and beliefs influence the feeding practices resulting in introduction of pre-lacteal feeds and early introduction of complimentary feeds regardless of the mothers awareness of the correct feeding practices. Hence it is very crucial to impart the right information on Infant and Young Child Feeding practices to the elders in the family as well, as they play a vital role in influencing the feeding practices. A study carried out by Alade et al in Nigeria showed that the nursing mothers received support with the household chores, assistance in taking care of the older child and verbal support from family members like grandmothers, mother in laws, friends and sometimes even from husband. Several women did not receive emotional support from family members while practicing exclusive breastfeeding and also had to face challenges like hunger, severe body ache

and problems due to painful breast conditions. Hence the support from family members plays a vital role in initiating and maintaining exclusive breastfeeding for the appropriate duration.²⁵ Continued breast feeding was practiced by 72% of the mothers, even though only 38.8% of them being aware of the correct duration as two years. This is similar to the DLHS data in the district (72.2%).¹³ Only one fourth of infants (25.9%) aged 6 to 8 months were introduced with solid and semi-solid foods. This was found to be much lower when compared to various other studies which reported a prevalence of 71.1%²⁶, 38.7%²⁷, and 62.5%.¹²

About 15.1% of the children were bottle fed in the present study. This figure is much lesser when compared to studies that have reported the prevalence ranging from 26% to 75%.^{12, 15}

Minimum diet diversity (MDD) is the indicator which shows if the child receives complete and balanced diet. In this study, Minimum Dietary Diversity as per WHO guidelines was observed only among 16.8% of the children. Minimum meal frequency (MMF) is an indicator which shows the appropriate number of times the child should be eating according to the age to meet the nutrient requirement of the body. We found that the Minimum Meal Frequency was met in 60.6% of the total proportion of children in 6-23 months age group. Minimum acceptable diet (MAD) indicator is the proportion of children aged 6–23 months who received at least the Minimum Dietary Diversity as well as at least the Minimum Meal Frequency. Minimum Acceptable Diet in our study was found to be 12.4%. This finding of our study is much lesser than that reported by NFHS-4 Karnataka together among breast fed and non-breast fed children (22.6%). Another study reported MDD, MMF and MAD to be 59%, 48% and 26% respectively¹⁶ which was found to be better than the present study.

We observed that women's education and occupation had a significant association with MAD. All the mothers who met the minimum requirement were literate and home makers by occupation. It is likely that the conditions of work environment like frequency and duration of breaks in between the working hours, maternity leave, proximity of work place influences the infant feeding practices.²⁸

Conclusion & Recommendations:

Inappropriate infant feeding practices are highly prevalent in the community, particularly the proportion of children exclusively breast fed (48.8%), introduction of solid and semi-solid foods at appropriate time as per guidelines (25.9%), and minimum adequate diet (12.4%). Knowledge and support systems favouring appropriate infant feeding practices is lacking in the community resulting in such poor indicators. Providing the correct information to the mothers on infant and young child feeding practices is required to root out the misconceptions around feeding practices including giving pre lacteal feed to the infants. Even the family members of the mother need to be made aware of the correct feeding practices as advice from family members plays a crucial role in influencing the time of initiation and

continuing exclusive breast feeding for the appropriate time. Efforts to promote and strengthen behaviour change by the health care delivery system regarding IYCF practices among the mothers have to be emphasised and practiced.

Limitation of the study:

The study was conducted in the Urban field practice area (an urban slum) of the medical college. Sample size was small especially with regard to distribution of the children according to sex and age group. Therefore, the finding in the present study limits its representativeness.

Acknowledgement: We are thankful to all the mothers for their co-operation. We acknowledge the support of interns and health workers in the UHTC.

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Conflict of Interest: None

Source of funding support: Nil

How to cite this article: Swetha Rajeshwari, Ayesha Nawaz, Sathyanarayana P, Vandana G. A study on Infant and young child feeding practices among children aged less than 24 months in an Urban slum of Raichur – A cross-sectional study.. *Nat J Res Community Med* 2018;7(3):158-162.

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NJRCM: www.commedjournal.in



ORIGINAL RESEARCH ARTICLE

DOI: 10.26727/NJRCM.2018.7.3.163-167

Year: 2018 Vol: 7 Issue: 3. Jul.-Sep. Page: 163-167

Enhancing communication and counselling skills of medical undergraduates; A pre and post intervention study

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Date of Submission : 25-04-2018

Date of online Publication : 07-07-2018

Date of Acceptance : 28-05-2018

Date of Print Publication : 30-06-2018

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ABSTRACT

Introduction: Effective communication skills are a core competency for physicians. This study with a pre-post-design was carried out keeping in mind the need to introduce communication & counselling skills training using interactive methods, and its practical application through student- family subject encounters in community setting. **Objective:** To evaluate the effect of teaching communication skills to final year Medical students. **Methodology:** The study was carried out on 79 final year medical students posted for two week rotatory posting in Community medicine. We used a before-and-after design to assess the students' performance in communication skills before and after an intervention, where the short training course on communication skills represented the intervention. The participating students were trained in Communication skills by didactic lectures according to Harvard Medical School (HMS) communication skills tool, Role plays and video screenings & improvement in communication & counselling skills was assessed by Objective Structured Clinical Examination (OSCE) and by observing their interaction with family subjects in allotted families in the community. **Results & Analysis:** Significant improvement in students' communication skills was observed in OSCE ($p < 0.001$). However the improvement in Family setting was not found to be statistically significant ($p > 0.05$) indicating the need for early introduction to formal teaching in communication skills, repeated reinforcement and subsequent assessment to build the competence level communication skills among medical students. **Conclusions:** Teaching communication and counselling skills to medical undergraduates by way of structured sessions will help them imbibe these skills for life.

Key-words: Communication skills, competence, interactive teaching, medical undergraduates.

INTRODUCTION

Effective communication skills benefit physicians and help to improve health outcome in patient care along with an overall impact on burden of disease in the community.¹

Effective communication is becoming increasingly important in present times. Given the complexities of health care, with involvement of larger health care teams and increasing number of available therapeutic options, it is essential that all communication is carried out in a safe manner. There is evidence that, though effective communication improves patient outcomes, doctors are not all ideal communicators and skills of communication can be learned.²

Counselling is an essential component of communication. It is face to face communication by which the health care provider helps the person to make decisions and choices that suit them best. Counselling on health promotion, disease prevention and cure is possible only when the physicians possess adequate knowledge on the topic and are able to transmit that information to the patients satisfactorily. It is particularly important in primary care settings where diagnoses often may be obtained by an attentive history taking alone.^{3, 4}

Moreover, patient outcomes such as drug adherence, patient satisfaction and coping with illness depend, amongst others, on the doctor's communication abilities. As history taking and communication with patients are frequent and essential tasks, these skills should be taught early and repeatedly throughout medical education curriculum.

There is now strong evidence that clinical communication can be effectively taught to and learned by medical students.⁵⁻⁷ The way communication should be taught is highly debated. Most experts share the conviction that good communication skills are not innate and can be learned through intentional, systematic and experiential training.^{8,9} Experiential learning includes role playing, interaction with simulated patient, practice under supervision and observation of self and others' practice.

The perceived benefits of these methods are based on the work of Kolb and Fry who proposed that learning is greatly facilitated when all four "learning environments" are simultaneously employed: affectively oriented (feeling), symbolically oriented (thinking), perceptually oriented (watching) and behaviorally oriented (doing).¹⁰

All these methods when combined with actual practice on patients include all four learning environments.

The present medical education curriculum, lays little emphasis on teaching communication skills to medical students. This study with a pre-post design was carried out keeping in mind the need to introduce communication & counselling skills training using interactive methods, and its practical application through student- family subject encounters in community setting. The objective assessment of effectiveness of such an intervention was also explored in this study.

MATERIAL AND METHODS

The study was carried out on MBBS Final year (Part-I) students posted in batches of 25 each for two week rotatory posting in Community Medicine after obtaining approval from Institutional Ethical Committee (IEC). Of the 100 students in the class, 79 were regular in attendance and were included in the study. We used a before-and-after design to assess the students' performance before and after an intervention, where the short training course on communication skills represented the intervention.

Before the intervention, students had not received any formal training in communication skills in the medical college. Three instructors/facilitators (Two Medical social workers and one PostGraduate student) of the department were trained on basic communication skills using The Harvard Medical School (HMS) Communication Skills Tool,¹¹ adapted from the Bayer-Fetzer Kalamazoo consensus framework.

The Communication skills tool identifies seven broadly supported essential communication competencies, with sub-competencies for each, applicable to most medical encounters and adaptable across specialties, settings and health issues.

The competencies include:

1. Building the patient–doctor relationship;
2. Opening the discussion;
3. Gathering information;
4. Understanding the patient's perspective;
5. Sharing information;
6. Reaching agreement on problems and plans; and
7. Providing closure

The topics chosen for training in communication & counselling skills were Infant immunisation and Diarrhoea management in a child. The facilitators were trained in counselling for Infant immunisation and Diarrhoea management. The same facilitators observed and evaluated the students in Objective Structured Clinical Examination (OSCE) and observed and evaluated in real family setting.

At the start of the posting, an oral informed consent was taken from all Final year (Part I) medical students. All students underwent an initial assessment of their communication & counselling skills wherein competency in interpersonal and topic specific communication skills was evaluated using OSCE by facilitators using a simplified close ended checklist during which students communicated with a standardized patient who was

trained to portray as the mother of a child requiring immunisation/ diarrhoea management.

Table 1: Day-wise schedule for communication & counselling skills training program

Day 1	Student apprised of the training in communication & Counselling skills Topics discussed and plan of 2-week posting explained to students
Day 2 & 3	Pre-intervention assessment : OSCE
Day 4	Pre-intervention assessment in Family setting: Observation of inter-personal Communication skills in allotted family.
Day 5 & 6	Students trained on: Basic communication skills using HMS Communication skills tool (Inter-personal and topic specific Communication & counselling skills) Importance of communication in medicine Good/ bad communication & counselling skills
Day 6- 10	Practice on family subjects during visits to allotted families
Day 11- 12	Post-intervention assessment: OSCE
Day 13	Post-intervention assessment in family setting : Observation of inter-personal communication skills in allotted families
Day 14	Feedback

There were ten OSCE stations, five each for communication and counselling skills in Infant immunisation and Diarrhoea management. One mark was awarded for correctly performing each item on the checklist & there were only two categories, done and not done for each item on the check list.

Students were also evaluated in the Family study setting only for Interpersonal communication skills at the start of the posting using the checklist for Interpersonal communication skills.

Thereafter students were given a short presentation on Communication skills and Counselling as per the HMS Communication skills tool, specific to Infant immunisation & Management of Diarrhoea by means of didactic lectures. Some counseling scenarios were portrayed by role play and videos were shown to the students to demonstrate and differentiate between good and bad counseling skills. Students were made to practice these communication skills on real family subjects encountered during their visits to allotted families in the community.

These encounters were observed by the same facilitators and feedback was provided on the spot.

A post-intervention OSCE was done at the end of the two week posting and results were compared for objective documentation of the intervention provided. Post-intervention inter-personal communication skills of all students were also assessed in the family setting and graded with the same checklist. The checklist was made by choosing items relevant to the objectives of the teaching session from the HMS communication skills tool.

Student feedback was taken through a questionnaire to know their perceptions regarding the training sessions. The questionnaire included 10 items with 5 point Likert scales ranging from strongly agree to strongly disagree, with one open ended question at the end for any additional comments/suggestions.

Data was analysed to see for any improvement in the students' communication & counselling skills as a result of the intervention. Paired-t test & Chi-square test were performed with probability set at 0.05.

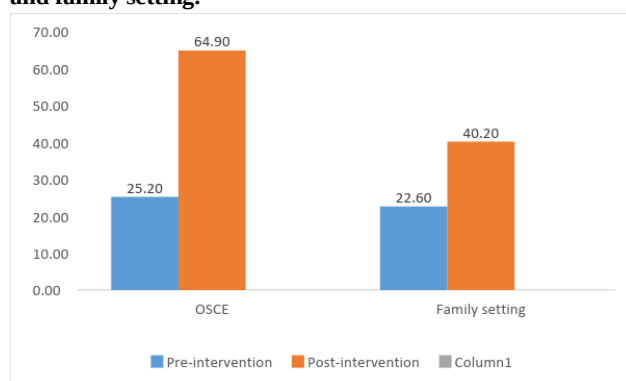
RESULTS

A total of 79 MBBS Final year (Part-I) students participated in this study in 4 batches. There was a significant improvement in communication and counselling skills of students as assessed through OSCE for both Infant immunisation and Diarrhoea management. (Table 2). There was significant improvement (Figure 1) seen in the communication and counselling skills of students after intervention in OSCE ($p < 0.001$). An important part of this study was the assessment of communication and counselling skills of students in the family setting. It was seen that the Post-intervention Mean score (%) in family setting was much lower as compared to the Post-intervention Mean score (%) for OSCE. (40.2 % as against 64.90 %). The difference between Pre and Post intervention Mean scores was not found to be significant ($p > 0.05$) in the family setting. The reasons for unsatisfactory performance of the students in family setting need further exploration. Possibly the structured pattern of Communication and counselling skills is easy to remember and practice in a test surrounding but not so in real life encounters. Students' careless attitude in non-testing environment, language barrier and unease while dealing with non-familiar people may be some of the factors responsible for this difference.

Table 2: Mean pre and post intervention OSCE scores of medical Undergraduates in selected competencies.

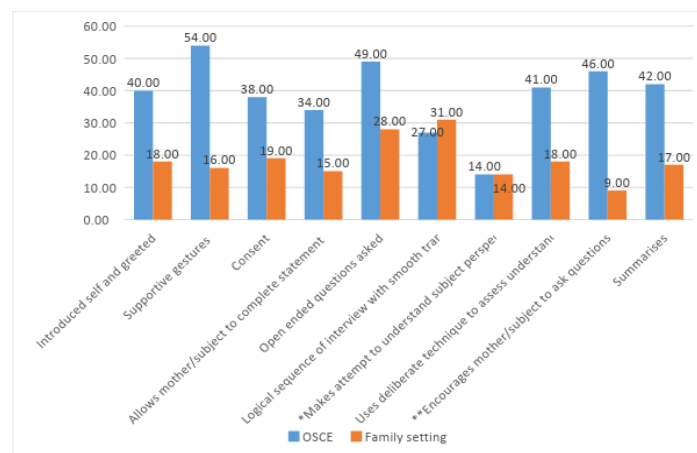
Competency assessed	Mean % Pre-intervention score	SD	Mean % Post-intervention score	SD	p-value by t-test
Communication skills for Infant Immunisation	26.07	7.05	65.31	11.53	0
Communication skills for Diarrhoea management	29.55	11.47	77.34	13.27	0

Figure 1: Mean Pre and post-intervention scores in OSCE and family setting.



The Post-intervention assessment (Figure 2) showed that there was improvement in the students' communication & counselling skills in both OSCE and family setting. However students' making an attempt to understand Mother/ family subjects perspective did not show any significant improvement in OSCE and family setting ($p > 0.05$) and students' encouraging mother/ family subject to ask questions and clarifications did not show a significant difference in Family setting.

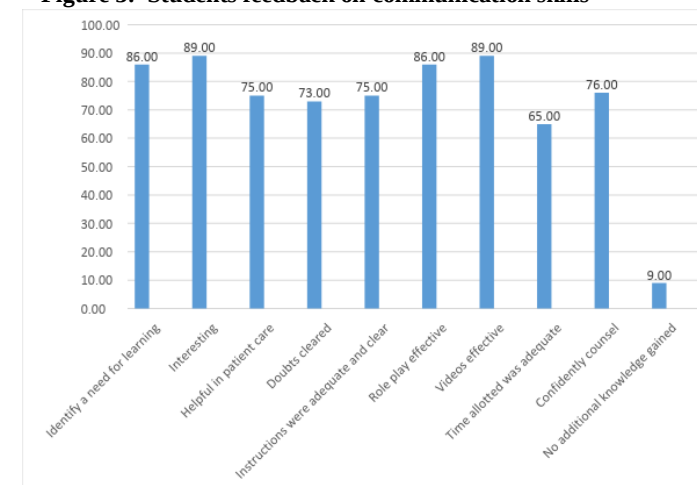
Figure 2: Improvement (%) in Communication skills in OSCE and Family setting



* $p > 0.05$ (OSCE & Family setting)

** $p > 0.05$ (Only Family setting)

Figure 3: Students feedback on communication skills



The communication and counselling training sessions improved greeting of mothers, use of supportive gestures, consent taking, allowing mother to complete statement without interrupting, use of open-ended questions and summarising next steps and explaining issues regarding follow-up at the end of their interaction with the mothers during OSCE significantly ($p < 0.001$).

Significant improvement in Communication skills was observed in most of the individual skills in Family setting as well ($p < 0.05$).

The students' feedback (Figure 3) showed that after the training session 86.0% students felt there was a need for learning communication/ counseling skills, 89% found it interesting, 75% felt it will be helpful in patient care, 73% felt their doubts were cleared, 75% felt that the instructions were adequate & clear, 86% felt the Role-plays were effective, 89% felt videos were effective, 65% felt the time allotted was adequate, 76% felt that they will be able to counsel confidently though 9% felt that there was no additional gain in their pre-existing knowledge on Communication skills.

DISCUSSION

It has long been recognised that the nature of medical practice is dependent on the way a doctor communicates with the patient.

During a lecture to medical students in 1899, Osler,¹² a physician stated “It is more important to know what sort of patient has the disease than what disease the patient has.”

Through effective communication, the doctor and patient achieve mutual respect and trust and that is why communication skills are considered to be the essence of clinical practice. Also these are particularly important in primary care settings where diagnoses often may be obtained by an attentive history taking alone. Communication skills teaching and training can be introduced at the beginning of clinical postings in medical college and developed with repeated practice over the years.

Choudhary & Gupta¹³ studied the attitude of fourth year medical students towards learning communication skills. Their study indicates that significantly higher number of students had a positive attitude toward learning communication skills. This is due to the fact that these students are in contact with the patients during clinical posting and begin to understand the importance of effective communication. The results of the present study were found to be in agreement with Though systematic teaching of these skills is challenging during formative years, training in communication during clinical posting can bring these skills to life and allow students and faculty to see their relevance.¹⁴ In the present study we introduced training of Communication skills during the students Family posting where these students can practice their newly acquired skills to improve their clinical competence. It has been argued that communication skills can be taught to medical students as short courses, however this study found that if the acquired skill is not put into practice as a part of curriculum it will be easily forgotten. Community Medicine family posting allows and offers students an opportunity to interact on medical, environmental & social issues with the community. This opportunity can be made use of effectively to hone their communication and counselling skills.

In this study we found that the structured approach through OSCE showed better results as compared to the students’ actual interaction with family subjects where students fumbled to find appropriate words for communication. This further re-emphasises the need for continuous re-reinforcement and practice sessions for capturing the essence of effective communication skills. Interactive teaching learning methods in the form of role play, video demonstrations revealed a positive effect on communication skills of students. Similar findings were observed in a study by Devenguele et al⁴ who used various methods like group discussions in small groups, role play, simulated patients & videotapes of real consultations.

Outcome : What this study adds

- Communication is a core clinical skill that can be taught and learned.
- Early introduction to formal teaching in communication skills, repeated reinforcement and subsequent

assessment can serve to build the competence level in medical students.

- Significant evidence is available of the utility of such initiatives and their potential contribution in producing more effective health care providers.

Limitations:

The present study is not able to predict the exact magnitude of the impact of intervention in view of the “one time” intervention. Repeated practice and assessment on these competencies numerous times over the course of undergraduate training can promote retention and further development of competence in communication skills. Our study is limited by our assessment of their immediate reactions, and not their long-term use of the acquired skills. This is an important limitation.

My Reflections:

- What was good:** The teaching sessions were appreciated by both students and facilitators and even though some findings were insignificant the apparent difference in the communication skills of students were visible in their interactions with the family subjects.
- What could have been done differently:**
 - Time management on part of facilitators was difficult as students were assessed in the family setting.
- The road ahead:** The present study was conducted on Final year (Part-I) students. The results would have been better if this was introduced earlier at the beginning of their clinical postings and reinforcement and practice done at all further levels.

CONCLUSION: Teaching communication and counselling skills to medical undergraduates with the help of didactic lectures, role plays and videos along with community exposure may aid in improving their communication skills with special emphasis on understanding the dynamics of feelings and emotions in a doctor–patient communication. Repeated structured sessions are needed in each clinical year and during the internship for a better and more sustained outcome.

IMPLICATIONS: We implemented a study for teaching and assessment to address the increasing professional need for enhanced interpersonal and communication skills training, particularly in the latter years of the undergraduate medical curriculum. Presently the majority of medical colleges do not make use of any framework for teaching and assessing communication skills.

Introduction of communication skill teaching will enable us to collect data regarding the retention of these skills, and whether uniform teaching and assessment over the entire course improves students’ performance.

We hope this study helps to develop a focussed strategy on promoting communication skills as a required competence throughout medical curriculum.

ACKNOWLEDGEMENT

I would like to acknowledge the support and contributions of my fellow colleagues and students who participated in this study.

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Conflict of Interest: None

Source of funding support: Nil

How to cite this article: Virk Amrit, Solanki Gahlot Neeti, Panigrahi Mahima. Enhancing communication and counselling skills of medical undergraduates; A pre and post intervention study. *Nat J Res Community Med* 2018;7(3):163-167.

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ORIGINAL RESEARCH ARTICLE

DOI: 10.26727/NJRCM.2018.7.3.168-172

Year: 2018 Vol: 7 Issue: 3. Jul.-Sep. Page: 168-172

Is health education effective in improving health awareness among garment factory workers?

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Date of Submission : 30-05-2018

Date of online Publication : 07-07-2018

Date of Acceptance : 21-06-2018

Date of Print Publication : 30-06-2018

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ABSTRACT

Introduction: Majority of workers in garment factories hail from poor socioeconomic backgrounds with limited knowledge regarding health. Poor health awareness often leads to unhealthy lifestyles in turn resulting in frequent illness, sickness absenteeism, reduced capacity for work and ultimately production losses. **Objective:** To assess knowledge regarding health and the effectiveness of a structured teaching programme in improving health awareness among workers of select garment factories in Bangalore. **Methodology:** A structured interviewer schedule was administered to 716 workers in selected garment factories in Bangalore, to assess their baseline knowledge on various health topics. Based on their felt needs, structured training programmes based on the peer to peer teaching model were conducted over a two year period (from June 2013 till May 2015) covering 6 major health domains - access to health care, menstrual hygiene, family planning, maternal health, sexually transmitted infections (STIs) including HIV/AIDS and nutrition. Following the training, the interviewer schedule was administered to a set of unmatched sample to assess change in knowledge, attitude and practice regarding health. Data was analysed using descriptive and inferential statistics. **Results:** All workers were female, middle to high school educated, between 18-50 years of age. Baseline knowledge regarding health in all 6 domains was low. Awareness regarding access to women's health services increased from 80.16% to 97.2%. Use of sanitary napkins during menstruation increased from 40.37% to 71.15%. Absenteeism from work due to menstrual problems was 24 days which reduced to 10 days. Daily fruit consumption increased from 61.09% to 86.8%. Knowledge regarding pregnancy risk factors (at least >2 symptoms) increased from 31.3% to 71.6%. Awareness about family planning methods increased from 80.6% to 98.8%, while current usage of family planning method increased from 45.4% to 72.5%. **Conclusion:** Health education played a substantial role in improving health awareness among garment workers.

Key-words: Garment Workers, Health Education, Health Awareness, Women's Health,

INTRODUCTION

According to WHO, over 1000 million people worldwide are employed in the small-scale industry.¹ The 'garment' industry of India is one such industry. The textiles sector in India contributes about 14 per cent to industrial production, four per cent to gross domestic product (GDP), and 27 per cent to the country's foreign exchange inflows. It also provides direct employment to over 45 million people, second only to agriculture.

Forty years ago, the industrialized countries dominated global exports in this area. Today, developing countries produce half of the world's textile exports. The Indian sub-continent is the second largest manufacturer of garments after China.²

A majority of the workers in the garment sector hail from poor socioeconomic backgrounds with limited knowledge regarding health. Garment workers are often migrant labourers who leave the comforts of their home, family and support systems to work long hours often with limited access to health care.³ In India, the garment sector is the second largest employer of women, nearly 1.2 crore women constituting 80% of the total workforce in this

sector.⁴ As these workers are away from their homes and native villages they miss out on the opportunity to attend any community health awareness programmes run by the government. Also, as they end up working for long hours in the garment industry they are not reached by the health systems and non-governmental organization working in the urban areas.

Lack of health awareness often leads to unhealthy lifestyles in turn resulting in frequent illness, sickness absenteeism, reduced capacity for work – all this impact their wages and contribute to production losses.

Low educational levels, migration and poor economic status of female garment workers make them much more vulnerable to poor nutritional choices and therefore illnesses and morbidity.⁵ Literature review showed very few studies done to assess the baseline knowledge regarding health among workers and thereby providing interventions and incentives which will help improve the overall health status of the garment worker. Therefore this study was conducted primarily to assess the baseline knowledge regarding health especially reproductive

health among female garment workers and later to provide a structured training to these workers so as to bring a positive change in their knowledge and attitude towards health.

Objectives

1. To assess the knowledge regarding their health among workers of select garment factories in Bangalore.
2. To assess the effectiveness of a structured teaching programme using a peer-to-peer education model on improving health awareness among workers of select garment factories in Bangalore.

METHODOLOGY

As part of the work place health intervention programme, the Division of Work Environment Department of Community Health, St. John's Medical College, Bangalore is working closely with several apparel manufacturing industries in and around Bangalore. Garment workers from ten selected garment factories were chosen to conduct the study. The study was conducted over a period of two years from June 2013 till May 2015. A sample of 716 female garment factory workers was chosen for this study. Convenient method of sampling was followed.

The required permissions were obtained from the management of the selected factories. Sampling method, written informed consent was obtained from every participant in the study. A structured interview schedule was administered to 716 garment workers to assess their baseline knowledge regarding health especially pertaining to reproductive health and family planning.

Based on the results of the baseline analysis and on the felt needs of the workers an intervention was designed at these factories wherein a structured training programme was developed. The training module focussed on 6 major health domains – access to health-care, menstrual hygiene, family planning, maternal health, sexually transmitted infections (STIs) including HIV/AIDs and nutrition. The intervention consisted of peer-educator method of training where few motivated women in each factory were selected as peer educators who underwent the training over a period of one year (one topic every two months). They in turn had to teach the other workers, in the intervening period between two topics during their working hours utilizing their lunch time, free time, etc.

After the training had been completed an unmatched sample of 695 garment workers who had been trained under the peer education programme and had received training in all the 6 modules were chosen for final analysis. These workers were not necessarily part of the initial baseline assessment. They were administered the interview schedule to determine the change in knowledge, attitude and practise towards health.

Statistical analysis

The data collected was entered in Microsoft Excel and analysed using SPSS version 20. Socio-demographic variables were described as frequencies and measures of central tendency. Data collected was analysed using

descriptive statistics. Means and proportions were applied. Tests of association such as the Two-proportion z-test were used.

RESULTS

A total of 716 female workers were included in the study. They mostly belonged to the age group of 18-25 years and were educated up to middle and high school level.

Table 1: Comparison between knowledge and practise regarding health before and after health education

Parameter	Before health education	After health education
Knowledge regarding antenatal risk factors	224 (31.3%)	498 (71.6%)
Mode of HIV spread	148 (20.6%)	355 (51.07%)
Sanitary napkin usage	289 (40.36%)	494 (71.07%)
Current family planning usage	325 (45.4%)	504 (72.5%)
Fruit consumption	437 (61.03%)	603 (86.8%)

Table 1, shows that the knowledge regarding pregnancy risk factors (at least 2 risk factors) was 31.3% before health education which increased to 71.6% following health education. Also, the knowledge regarding mode of spread of HIV was low at 20.6% which increased to 51.07% after health education. Change in healthy practices was also noted as more women began using sanitary napkins during menstruation, from 40.36% to 71.07%. Use of some method of family planning also improved from 45.4% to 72.5%. There was a similar rise noted in daily fruit consumption (from 61.03% to 86.8%) The awareness regarding the availability of nearby women's clinic was 80.16% which rose to 97.2% following health education. The mean number of days absent from work due to menstrual problems was 24 days for a period of six months (among 698 women) which dropped to only 10 days (for 695 women) following health education.

Table 2: Comparison between knowledge regarding reproductive health and family planning -before and after health education.

Parameter	Before health education	After health education
Antenatal risk factors (>2)	224 (31.3%)	498 (71.6%)
Post-natal risk factors (>2)	141 (19.69%)	304 (43.8%)
Institutional delivery	540 (75.4%)	695 (100%)
Methods of family planning (>2)	236 (32.9%)	604 (86.9%)
Uses of family planning methods	270 (37.7%)	393 (56.5%)

Table 2, shows that there was a rise in knowledge gained regarding antenatal risk factors (31.3% to 71.6%) also post-natal risk factors (from 19.69% to 43.8%). While

75.4% of the workers knew about the importance of institutional delivery before health education and this number increased to 100% following health education. Knowledge regarding both the methods of family planning and various uses of family planning methods improved following health education. Knowledge regarding the various methods of family planning also increased from 32.9% to 86.9% wherein tubectomy was known to be the most common method followed by Intra-uterine contraceptive devices (IUCD) and Oral contraceptive pills (OCPs).

Table 3: Association between knowledge parameters before and after health education

Knowledge parameters	Before health education	After health education	Z score	p value
Antenatal risk factors (>2 risk factors)	224 (31.3%)	498 (71.6%)	-15.169	0.03*
Mode of HIV spread	148 (20.6%)	355 (51.07%)	-12.006	0.012*
Post-natal risk factors (>2 risk factors)	141 (19.69%)	304 (43.8%)	-12.000	0.01*
Regarding institutional delivery	540 (75.4%)	695 (100%)	-14.009	0.01*
Uses of family planning	270 (37.7%)	393 (56.5%)	-7.0943	0.01*
Awareness about women's clinic nearby	574 (80.16%)	676 (97.26%)	-9.994	0.01*

*p<0.05

Associations

Table 3, show the knowledge regarding health before and after health education. The change in knowledge is statistically significant (p<0.05). Knowledge parameters especially the ability to name more than two antenatal risk factors requiring doctor's visit, name more than two post-natal risk factors requiring doctor's visit, mode of spread of HIV/AIDs, uses of family planning methods and awareness about the availability of a nearby women's health clinic significantly improved following health education.

Table 4: Association between practice parameters before and after health education

Change in practice parameters	Before health education	After health education	Z score	p value
Sanitary napkin usage	289 (40.36%)	494 (71.07%)	-11.677	0.01*
Current usage of family planning methods	325 (45.4%)	504 (72.5%)	-10.320	0.036*
Daily consumption of fruits	437 (61.03%)	603 (86.8%)	-9.455	0.01*

*p<0.05

Table 4, show the change in practice following health education. There was a statistically significant increase (p<0.05) in the number of women who used sanitary napkins during menstruation and also the number of women who followed some method of contraception. Daily fruit consumption increased following health education which was also statistically significant (p<0.05).

DISCUSSION

In this study we found that the garment workers' awareness regarding availability of nearby women's health clinic was 80.16% which increased to 97.2% following health education. This is an important finding because many of the times a garment worker is unable to seek health care despite being sick due to myriad of reasons such as overtime and challenging work schedules, recognised ESI hospitals being located at a distance from their home and/or workplace, which in turn would mean a significant wastage of time and loss of wages. Similar findings were observed in another experimental study done among the garment factory workers of Bangladesh by Abul Barkat et al, wherein 95% workers in the intervention group who were given health education knew about a nearby clinic while only 48% of the workers in non-intervention group knew about the clinic.⁶ A mere increase in the knowledge about the availability of health care services nearby does not ensure increase in its utilisation. Hence, certain measures such as establishing a first aid room or health clinic run by a qualified doctor or nurse within the factory premises or starting evening OPDs in the vicinity of the factory will ensure better utilization of these health care services.

In this study the knowledge regarding contraception (ability to name at least 1 method of contraception) increased from 52.3% to 86.9% following health education. This in turn shows that a majority of these women have an unmet need for family planning. The lack of contraceptive awareness and the poor utilization of contraceptives by these women put them at an increased risk of consequences such as unwanted pregnancies, repeated abortions, contracting STD/HIV. Similar findings were found in a study done among garment workers in Phnom Pehn, Cambodia wherein participatory learning techniques were employed to assess the success of a reproductive training programme conducted among them. Spontaneous knowledge of at least one modern contraceptive method increased significantly (from 71% to 89%).⁷ One way to address this gap in knowledge would be to conduct repeated training and educational sessions focussed on contraception – methods, uses, myths and misconceptions about each method. Counselling sessions on appropriate family planning methods can empower women to take informed decisions regarding family planning. Access and availability of contraceptives should be improved wherein either the contraceptives or information regarding contraceptives should be made available in the clinics attached to the factory.

In this study we found that only 40.3% of the women were using sanitary napkins during menstruation while the rest of 59.7% of workers were using cloths or rags from the factories as menstrual cloth. This is a disturbing trend because these rags if used unclean or if not washed and dried properly can predispose the woman to develop gynaecological infections and menstrual irregularities. Menstrual-related absenteeism would also increase thereby affecting the workers' income and production at the factories. We found that absenteeism due to menstrual problems was 24 days in the past six months which came up to 4 days a month. In a survey conducted by WaterAid it was found that majority of Indian women reuse absorbable cloth during menstruation (89%) while sanitary napkin usage was found to be very low (7%).⁸ In India, mothers, elder sisters and friends serve as educators on matters related to reproductive health and it is found that they themselves lack the necessary knowledge.^{9,10} Society's 'taboo' attitude towards menstruation related issues serve as barriers to access the right information. Certain measures such as repeated education of these women regarding menstrual hygiene and use of sanitary napkins, ensuring that sanitary napkins are made available at the factory clinic at a lower cost, maintenance of separate clean washroom facilities for women and so on go a long way to promote menstrual hygiene among them. Similar findings were reported from a study conducted in Bangladesh among the female factory workers where 60% of them were using rags from the factory floor as menstrual cloths. These could be highly chemically charged and are often freshly dyed. Infections were common, leading to 73% of women missing work for an average of six days in a month.¹¹

In this study the practice of sanitary napkin usage increased from 40.3% to 71.2% following health education. Also the absenteeism from work due to menstrual problems showed a considerable decline. These findings reiterate the fact that the key to bringing about a change in menstrual practices is through education which ultimately can break down the barriers and misconceptions surrounding menstruation and help to promote their overall health and confidence at the workplace.

The overall knowledge regarding HIV/ AIDs was poor among the garment workers studied. While 60.4% of the workers knew that HIV can be sexually transmitted, this number rose to 80.9% following health education. In a study done among 303 garment workers in Dhaka city by Hasibul Hasan et al it was found that 98.3% of the workers had heard about the word HIV and that almost 78.9% knew that the disease was transmissible from person to person by sexual intercourse.¹² In another study conducted among 216 garment workers to assess the awareness regarding HIV/AIDS and high risk behaviours in Bangalore, knowledge about causation and prevention about HIV/AIDs was found to be very low especially among women workers.¹³ The reason for low baseline knowledge regarding HIV could be attributed to the low education status of the garment workers. However, these

workers due to their migrant nature and ignorance form a significant vulnerable population at risk of developing sexually transmitted infections (STIs) including HIV/AIDS. Hence educating these workers regarding HIV/AIDs and its transmission is of paramount importance.

In this study following health education regarding balanced diet and nutrition there was a significant increase in the fruit consumption from a baseline of 61.1% to 86.8%. In a similar study conducted among workers in a public company in Rio de Janeiro, Brazil to evaluate the impact of activities promoting the consumption of fruits and vegetables in the workplace, it was found that following education activities there was a 33% increase in the fruit and vegetable consumption by the employees.¹⁴ Workplace is strategically important because it is where the workers spend almost half of their day and consume at least one main meal here. Hence initiatives and nutrition campaigns which promote healthy eating at the workplace will show long term benefits for improving workers health and reduction in non-communicable diseases among them.

Limitation

Non-probability sampling technique is one limitation in this study. However, we have tried to overcome this limitation by including a large sample size (n= 716), visiting multiple factories which are geographically spread out and recruiting workers from different departments in our study.

Conclusion

The baseline knowledge regarding health in all domains was found to be low. There was significant increase in knowledge regarding pregnancy risk factors, mode of spread of HIV, etc. Sanitary napkins usage during menstruation increased from 40.37% to 71.15%. Absenteeism due to menstrual problems dropped from 24 to 10 days over a six month period. Daily fruit consumption increased from 61.1% to 86.8%. This increase was found to be statistically significant. Health education played a substantial role in improving health awareness among garment workers.

Recommendation

Workplace health intervention programme was found to be successful and it can be a replicable model in other factories. Such intervention helps to greatly improve awareness and behaviour related to general and reproductive health. Proper awareness and counselling will reduce the risk behaviours and help these young people to have a healthy lifestyle.

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Conflict of Interest: None

Source of funding support: Nil

How to cite this article: Merlyn Joseph, Naveen Ramesh, Bobby Joseph. Is health education effective in improving health awareness among garment factory workers?. *Nat J Res Community Med* 2018;7(3): 10.26727/NJRCM.2018.7.3.168-172.

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NJRCM: www.commedjournal.in



ORIGINAL RESEARCH ARTICLE

DOI: 10.26727/NJRCM.2018.7.3.173-177

Year: 2018 Vol: 7 Issue: 3. Jul-Sep. Page: 173-177

Assessment of nutritional status and quality of life in the elderly registered at three rural elderly day care centres in Anekal Taluk, Bangalore Urban District

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Date of Submission : 13-04-2018

Date of online Publication : 07-07-2018

Date of Acceptance : 28-05-2018

Date of Print Publication : 30-06-2018

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ABSTRACT

Introduction: The elderly in rural India are at risk of malnutrition and decreased quality of life (QOL). The Department of Community Health, St. John's Medical College, Bangalore initiated the "Grama Hiriyara Kendra" ("village senior center") project in three villages in Anekal Taluk, Bangalore district where elderly village residents arrive in the morning, go through a program of physical activity, prayer, social interaction, a meal at 1 pm, and leave in the afternoon. This study was done to assess nutritional status and QOL of the GHK attendees, which could be used to assess the utility of the GHK intervention. **Objective:** To assess the nutritional status and quality of life of elderly persons registered in three village senior centers in Anekal Taluk, Bangalore district. **Methodology:** A cross-sectional study was done among 66 elderly persons registered in 3 GHKs. A structured interview schedule consisting of socio-demographic details, WHO Quality of Life (QOL)-BREF, Mini nutritional assessment, Hindi mental state examination and Activities of Daily Living scale were administered. A basic health assessment was done. Informed consent was taken from all the study participants. **Results:** Of the 66 study participants, 26(39.4%) were at risk of malnutrition and 7(10.4%) were malnourished. Scores for all four domains of QOL dropped as age increased. Elderly subjects who were involved in household activities (20%) were found to score better in the physical domain of QOL. Thirty-two (49.2%) of the elderly assessed were at risk for fall. **Conclusion:** Almost 50% of the subjects were malnourished or were at risk for malnutrition. Quality of life of the subjects dropped with increasing age. Repeat assessments will help document the difference made by the GHK intervention.

Key-words: Nutritional status, quality of life, rural elderly, elderly day care centres

INTRODUCTION

"Good health adds life to years" was the theme of World Health day 2012.(1)Population ageing is the trend in the developing countries all over the world. Between 2015 and 2030, the number of people in the world aged 60 years or over is projected to grow by 56 per cent, from 901 million to 1.4 billion, and by 2050, the global population of older persons is projected to more than double its size in 2015, reaching nearly 2.1 billion.(2)The elderly population in India, (defined as those aged 60 years and above)(3) forms 8.6 % of the total population currently.(4)It is projected that this will go up to 11.9% by 2031 and 17.3% by 2051.(5) This demographic transition has been attributed to increasing life expectancy and falling fertility rates.(6)Within the next five years, it is expected that the number of adults aged 65 and over will outnumber children under the age of 5, and by the year 2050, older adults will outnumber children under the age of 14. The focus now should be on how good health throughout life can help older men and women lead full and productive lives and be a resource for their families and communities.(1) It is time to concentrate more on the health of the elderly to move along with the transitions happening across the world.

According to the WHO, "Developing countries will become old before they become rich, while industrialized countries became rich while they were growing old".(7)

Malnutrition can affect any person across the globe irrespective of age. Malnutrition in children was the prime focus all these years. Older persons are also equally vulnerable for malnutrition considering the physiological changes occurring in the body as well as other socio-environmental factors that contribute to the same. Even though malnutrition in the elderly is common in the clinical setting, it is usually under-recognized. Malnutrition in general can lead to serious consequences in terms of morbidity and mortality among older persons. It is seen as a marker for illness but is usually ignored in daily clinical practice, both in the hospital and community settings.(8)

Malnutrition can be considered as being under nutrition or over nutrition. But in developing countries like India, when we say malnutrition, it frequently refers to under nutrition, even though with globalization and industrialization, the life style and the eating habits of the population is changing. Now we are moving to the double

burden of malnutrition.(6)Under-nutrition can be due to macronutrient deficiency, micronutrient deficiency or both. Considering that older persons are particularly vulnerable to malnutrition, attempts to provide them with adequate nutrition presents many practical problems, an important one of which is that their nutritional requirements are not well defined. Along with the natural ageing process there are dietary factors which contribute to this.(9) Hence, improvements in diet and other nutritional interventions need to be carried out for the elderly population in India. Few studies have been carried out to assess the prevalence of malnutrition in the elderly worldwide. Most of them are based on the Mini Nutritional Assessment form (MNA).The MNA® is a screening tool to help identify elderly persons who are malnourished or at risk of malnutrition.(10) In a study done in West Bengal in 2014 using MNA®, 29.4% elderly were malnourished and 60.4% were at risk of malnutrition. Females (59.4%) were significantly more malnourished than males (40.6%).(11)

Quality of Life (QOL) also is affected as the age advances. This can be due to physical, mental or social changes that occur with ageing process. WHO defines Quality of Life as an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns.(12) A new concept of elderly day care centres are slowly emerging which is similar to that of an 'Anganwadi Kendra' for children. In a study conducted in Tamil Nadu, using WHO – QOL BREF scale, in a day care centre, there was a significant reduction in psychiatric morbidity and improvement in quality of life scores at 3 months for subjects who attended the program. The improvement in quality of life persisted after adjusting for gender, socioeconomic status and baseline scores.(13)

The Department of Community Health, St.John's Medical College, Bangalore initiated the *Grama Hiriyara Kendra* (GHK- village senior centers) project in three villages in Anekal Taluk to address the holistic needs of elderly in rural areas through these "village senior centers". A typical GHK begins to function at 9.00am run by a teacher and helper. The elderly gather at the centre by 10.00 am. The different activities include some prayer or bhajan, physical activity, mingling with each other, weaving, or games. Supplementary nutrition also is provided in the form of milk/ buttermilk and one meal. As a unique social and nutritional intervention, it is necessary to study the effect that participation in a centre like this would have in the people who attend. This study was done, to yield information on nutritional status and QOL which could be used to assess the utility of the GHK intervention.

Objectives: The objective of this study was to assess the nutritional status and quality of life of the elderly registered in three "village senior centres" in Anekal Taluk, Bangalore district.

This was a cross sectional study done in three rural elderly centres in Anekal Taluk (Mugalur, Adigarakallahalli and Handenahalli) for a period of 2 months from July 2016- Aug 2016. Institutional Ethical Committee approval was obtained before the start of the study. All members attending the three rural elderly centres were included in the study after obtaining their informed consent. Since all the members were included, sample size calculation was not done. The interview schedule consisted of socio demographic details of the subjects,WHO Quality Of Life - BREF scale(WHOQOL-BREF), Mini Nutritional Assessment(MNA),Hindi Mental Status Examination(HMSE), and Barthel's Activities of daily living index(ADL). Socioeconomic status was assessed using Standard of Living Index (SLI).The WHOQOL-BREF scale contains a total of 26 questions based on a four domain structure; physical health, psychological, social relationships, and environment. The four domain scores denote the individual's perception of quality of life in each domain. Domain scores are scaled in a positive direction. The raw scores were converted into transformed scores during analysis.(14)MNA full form (MNA-FF) was used, with the following cutoffs: 24-30 points (Normal

Nutritional status), 17-23.5 points (at risk of malnutrition), <17 points (malnourished).(15)Along with the interview schedule, a basic health assessment which included measurement of blood pressure, random blood sugar, anthropometry, and risk of fall was done. The data was entered in Microsoft Excel and analyzed using SPSS 16. Kruskal-Wallis test was used to check for associations.

RESULTS

The study was done on 66 elderly persons attending the three GHKs with a response rate of 100%. Mean age of the population was 68.26 years. (SD: 6.36) Majority (56.1 %) of the respondents were aged 60 - 69 years. The youngest was 60 years old and the oldest, 86 years. The other demographic findings were as follows: Of the 66 study participants, 83.3% were females, most (56.1 %) have not attended school; many (60.6 %) were currently unemployed. About 81.8 % followed Hindu religion and 54.5 % were widowed. Approximately 51.5 % of the elderly were either from three generation or joint family. (Table 1)

The habits among the elderly who attended the day care centres were also assessed. Majority of the elderly, 47 (71.2%) were in the habit of using oral tobacco. Functional assessment of the elderly was done using different methods. The Barthel's ADL index mean score was 18.97 (minimum score of 15 and maximum score of 20) with all the elderly examined being functionally independent. The HMSE scores indicated that 47 (71.2 %) were cognitively impaired. The risk of fall assessment

showed 33 (50.8%) were at risk of fall. (Table 2) Co-morbidities of the elderly included both self reported as well as high recordings of blood pressure measurements and random blood sugar levels. 28 (42.4 %) of them did not have any self reported co morbidities. The prevalence rates of diabetes and hypertension (self reported and newly diagnosed) was, 10.6 % and 21.2 % respectively. 19.6 % had both conditions.

Table 1: Socio-demographic details (n= 66)

Variables	Category	Number (%)
Age(years)	60 -69	37 (56.1)
	70- 79	23 (34.8)
	80 -89	6 (9.1)
Gender	Male	11(16.7)
	Female	55 (83.3)
Education	Not attended school	37 (56.1)
	Primary school	17(25.8)
	Middle school	7(10.6)
	High school	4(6.1)
	Graduation or above	1(1.5)
Occupation	Government official	1(1.5)
	Farmer	1(1.5)
	Manual laborer	1(1.5)
	Home maker	7 (20)
	Currently unemployed	40 (60.6)
Religion	Others	3 (4.5)
	Hindu	54(81.8)
	Muslim	12(18.2)
Type of family	Nuclear	16 (24.2)
	Joint	5 (7.6)
	Three generation	29 (43.9)
Marital status	Extended	16 (24.2)
	Married	30 (45.5)
	Widow/widower	36 (54.5)
SLI	Low	9 (13.6)
	Middle	28(42.4)
	High	29 (43.9)

Table 2: Functional assessment of the elderly

Variable	Category	Number (%)
Timed get up and go test (TUG) (n = 65)*	Normal for age	33 (50.8)
	Risk of fall	32 (49.2)
HMSE (n = 66)	Normal	9 (13.6)
	Cognitive impairment	47 (71.2)
ADL(n =66)	Mean score :18.97	SD: 1.252
Min.Score: 15	Max Score: 20	

*One subject refused

The nutritional status of the elderly was assessed using the MNA scores. Out of the 66 elderly, 26 (39.4 %) were at risk of malnutrition and 7 (10.4 %) were malnourished. The QOL assessed using the WHOQOL – BREF had four domains for which the mean scores, median, and inter quartile range were obtained. The elderly had better median scores in the environmental and psychological domains compared to social relationships and physical health. The lowest median score was seen in the physical health domain. Since the data was not following normality the median and inter quartile ranges were used for further analysis (Table 3)

Table 3.Quality of life of the elderly (WHOQOL –BREF) (n =66)

Domain	Mean score	Standard deviation	Median	Inter quartile range
Physical health	45.09	22.173	44	31 -63
Psychological	64.12	20.551	69	48.5 -81
Social relationships	59.02	27.77	56	31 -81
Environmental	70.94	14.456	72	61.25 -81

Table 4: Association between HMSE score and educational status

Education	HMSE Score		
	Cognitively impaired	Normal	Total
No schooling	7(18.9)	30(81.1)	37(100)
At least primary school	12(41.4)	17(58.6)	29(100)
Total	19(28.8)	0.143(71.2)	66(100)

*chi square value =4.001, p value = 0.045.Numbers within the parenthesis are percentages.

Kruskal-Wallis test was performed to find out if there is any association between each score and demographic variables. Significant association was found between HMSE scores and education as well as QOL and nutritional status.(Table 4&5)

DISCUSSION

The purpose of this study was to assess the QOL and nutritional status of elderly attending the day care centres. In this study we found that majority 37 (56.1%) of respondents were aged 60-69 years which constitutes the ‘young old’ among the elderly. 55 (83.3 %) of them were females and 37 (56.1%) have not attended school .The higher proportion of females maybe due to the fact that elderly males are still working and hence they are not able to attend the day care centres. 60.6 % of the respondents were engaged in mostly agriculture before and currently they are not working. Majority, 55% lost their spouses, and most of the households are still following a joint family or three generation family norm. Majority of the elderly belonged to high social class according to SLI, which may be attributed to the fact that the village itself has a high majority of high social class population. Another explanation for this would be due to the fact that

the middle and lower income groups are still working for meeting their daily needs, compared to the higher class group.

Table 5: Associations between QOL and other factors (n =66)

Score	WHOQOL -BREF			
	Physical	Psychological	Social Relationships	Environmental
	(IQR**)	(IQR)	(IQR)	(IQR)
Age Group(Years)				
60 -69	44	69	69	75
	(31 -72)	(50 -81)	(44 -87)	(59.5 - 81)
70 -79	44	69	56	75
	(25 -63)	(44 -81)	(31 -81)	(63 -88)
80 -89	25	47	50	59
	(17 -47)	(17.5 - 67.5)	(28 -94)	(45.25 - 67.5)
p value	0.094	0.143	0.737	0.098
Occupation				
Currently unemployed	44	69	69	75
	(31 -72)	(50 -81)	(44 -87)	(59.5 - 81)
Home -maker	44	69	56	75
	(25 -63)	(44 -81)	(31 -81)	(63 -88)
Others	25	47	50	59
	(17 -47)	(17.5 - 67.5)	(28 -94)	(45.25 - 67.5)
p value	0.094	0.143	0.737	0.098
Nutritional status				
Normal	63	69	69	75
	(38-75)	(56 -84)	(50 -81)	(69 -88)
At risk of malnutrition	41	63	69	66
	(14 -56)	(48.5-81)	(31 - 84.25)	(56 -81)
Malnourished	31	31	31	56
	(25 -31)	(25 -44)	(25 -56)	(56 -63)
p value	0.002	0	0.122	0.002

Tobacco use is very much prevalent in the population under study, with 54.5 % of them still continuing to use oral tobacco. Habitual chewing of betel quid or use of tobacco in smoking or smokeless forms by men and women in India is due to less awareness of its health hazards or because of prevalent socio-cultural perceptions of its beneficial effects.(16) In a study conducted among adults in Gujarat, the overall prevalence of tobacco use (in all forms) was 18.2%; among all participants, 14.2% smoked while 9.4% chewed tobacco in several forms. Among tobacco users, 77.8% smoked bidis and cigarettes while 51.7% chewed or used smokeless forms of tobacco such as paan masala, paan, gutka, toothpaste, and other commercially available tobacco products.(17)

All the subjects were functionally independent according to ADL index, which is probably because the highly dependent population would not be able to use facilities

such as the GHK. The high proportion with cognitive impairment would probably an error in the results which can be explained by the association of the same with educational status. The HMSE tool had questions which were difficult to be understood and answered by a person without a formal education. The study found out that 33 (50.8%) of the study subjects were at risk of fall, which is an eye opener to focus more on the gait and musculoskeletal problems in the elderly.

The QOL scores showed that the elderly had better median scores in the environmental and psychological domains compared to social relationships and physical health. In our study, the mean (SD) for Physical QOL Psychological QOL, Social Relationship QOL and Environmental QOL were 45.06 (22.1), 64.12(20.55), 59.02 (27.77) and 70.94 (14.45) respectively. In a study conducted in Malaysia, the mean (SD) for Physical QOL Psychological QOL, Social Relationship QOL and Environmental QOL were 56.7 (10.64), 57.9 (11.73), 66.8 (15.01) and 65.3 (13.02), respectively which is comparable except for a significant difference in the physical health domain. This can be attributed probably to the osteoporotic musculoskeletal problems prevalent in the elderly.(18)

Out of the 66 elderly, 7 (10.4 %) were malnourished and 26 (39.4 %) were at risk of malnutrition. In a study done in West Bengal in 2014 using MNA®, 29.4% elderly were malnourished and 60.4% were at risk of malnutrition. Females (59.4%) were significantly more malnourished than males (40.6%).(11) According to a study in Tamil Nadu, South India, as evaluated by the MNA, 14 % of the 227 subjects were malnourished and 49 % were at risk of malnourishment.(19) The difference in the proportions may be due to the less sample size.

As shown in table 8, the physical domain of QOL reduced as the age advanced which may be due to the age related physiological changes like reduction in the muscle mass as well as bone density. The physical domain of quality of life remained better, in those who are engaged in regular household activity compared to other categories which signifies the importance of being active to be physically fit. Those who were having a normal nutritional status had better scores in the QOL domains which were statistically significant. In a study conducted in Austria, the MNA®-FF score was significantly associated with QOL domains 'physical health' ($\beta=0.23$; $p=0.036$), and 'social participation' ($\beta=0.28$; $p=0.013$). (20)

Conclusion

Almost 50% of the subjects were malnourished or were at risk for malnutrition. Quality of life of the subjects dropped with increasing age. 49.2%of subjects were at risk of fall. With the interventions done in the GHK, which includes supplementary nutrition for all elderly attending the day care centre, and physical exercises to address risk of fall, we expect improvement in the above mentioned problems. Repeat assessments will help document the difference made by the GHK intervention.

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Conflict of Interest: None

Source of funding support: Nil

How to cite this article: Pretesh Rohan Kiran, Minu Rose Mani, Arvind Kasthuri, Ashish B, Nikhil Rathitra, Swati C , Nimisha Thomas Assessment of nutritional status and quality of life in the elderly registered at three rural elderly day care centres in Anekal Taluk, Bangalore Urban District. Nat J Res Community Med 2018;7(3):173-177.

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NJRCM: www.commedjournal.in



ORIGINAL RESEARCH ARTICLE

DOI: 10.26727/NJRCM.2018.7.3.178-181

Year: 2018 Vol: 7 Issue: 3. Jul-Sep. Page: 178-181

A CROSS SECTIONAL STUDY TO ASSESS THE FACTORS INFLUENCING THE ACADEMIC PERFORMANCE OF THE MEDICAL STUDENTS IN BENGALURU

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Date of Submission : 28-11-2017

Date of online Publication : 07-07-2018

Date of Acceptance : 08-05-2018

Date of Print Publication : 31-07-2018

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ABSTRACT

Background: Academic performance determines the knowledge, skills, attitudes and behaviours needed to practice medicine. There are various factors which can directly or indirectly have an influence on the performance of medical students. Identifying those factors is crucial to improvise the overall performances of the students. Hence this study was taken up to assess the factors influencing the academic performance of the medical students. **Material and methods:** A cross sectional study was conducted in Government medical college of Bengaluru among 420 undergraduate M.B.B.S. students from August to October 2016. Data was collected using self-administered, semi-structured questionnaire. **Results:** Among the different factors, gender, type of family, Socio-economic status, place of residence, sleep pattern and English coping difficulty was found to have the statistically significant association with the academic performance. **Conclusion:** Various factors have an influence on the academic performance of the medical students. Identifying these factors is crucial. In the study, factors like sleep pattern and English coping difficulty are the modifiable factors.

Key-words: Academic performance, Undergraduates, Gender, type of family, Place of residence.

INTRODUCTION

Medical education is complex and demands the students to acquire knowledge, skills and competence in multiple disciplines over a period of time.¹ In India and many developing countries undergraduate medical education is facing challenges. Even though efficient teachers are provided in medical colleges, the performance of the medical students have declined significantly.²

There are various factors which directly or indirectly have an influence on the performance of medical students, such as, syllabus in bulk, lack of time management, lack of guidance and support from their parents, staying away from home, bad habits, deviation from studies, parental and peer pressure, physical, emotional and mental health, personality, socio-economic factors, stress, depression, dedication towards studies, motivation, concentration in the class, involvement in the clinical discussion etc.^{3, 4, 5}

Psychological or emotional factors and behavioural strategies for effective adaptation to concrete environment demands and their associated emotional stress also play a role in the academic performances of the students.⁶ If the factors leading to decline in performance are not addressed, they can go for failure, drop outs and results in inefficient doctors.²

Medical students are expected to maintain high standards of academic performance which demonstrate that they have attained good knowledge, skills, attitudes, and behaviour needed to practice medicine. So it is essential to assess the factors influencing the performance, to improve the overall outcome of students. Hence this study

was conducted to assess the factors influencing the academic performance of the medical students in Bengaluru.

MATERIAL AND METHODS

A Cross Sectional Study was conducted in Government medical college of Bengaluru among undergraduate M.B.B.S. students from August to October 2016. Sample size was calculated based on the study conducted by Shawwa LA et al⁷, in which the 60.7% of high Grade point average students spent less than 2 hours on social networking per day. Based on prevalence value of 60.7% and with absolute precision of 5%, the sample size was calculated as 381. A non-response rate of 10% was added and sample size was rounded off to 420. After obtaining ethical clearance, the study was conducted. By simple random sampling technique, participants were chosen from 2nd year till internship. Data was collected using pre tested, semi structured and self-administered questionnaire, by the principal investigators after obtaining consent from the students. Questionnaire consisted of socio demographic profile of study participants, their exam scores and also the various factors which may influence it. Data was entered in excel and analysis was done by using SPSS software. Results are presented in terms of frequencies and percentages. Chi square and Fischer's exact test was applied to find the association between variables and the academic

performance. P value < 0.05 is considered significant. Tables are added wherever necessary.

RESULTS

A total of 420 students participated in the study. Among them 209 students were from 3rd term, 39 students were 5th term, 118 were 6th term, 27 were 7th term and 27 were interns. About 267 (63.6%) were males and 153 (36.4%) were females. Majority (91.2%) were belonging to Hindu religion. The students from general merit quota were 78.6% and reservation quota was 21.4%. Majority of the students were belonging to the nuclear family (82.6%), followed by joint family (10.5%) and three generation family (6.9%). Amongst them, 58.1% were staying in the hostel. Majority of the students were from the upper SES (53.1%), upper- middle (42.4%) and to the lower middle SES (4.5%) and no one were from the Upper lower and lower socioeconomic status. The average allowance of the students was Rs.4535 per month. Around 3.1% (13 students) were not receiving any allowances. Among the students who received the allowances, majority, 73.3% (308 students) were satisfied with the amount and 26.7% were not happy with the allowances. Among the students who were staying in the hostel (245), around 118 (46.1%) of the students were satisfied with the facilities provided and 123 (48%) were satisfied with the food provided in the hostel. The average number of absenteeism per month was 3 days with the maximum of 12 days in a month. The average number of study hours among the students was 2-3 hrs per day. Majority (58.3 %) secured first class marks in the recent examination and 2.9% had failed in the exams (Table 1).

Table 1: Academic performances of the students

Academic performance	Frequency of students (N)	Percentage of students (%)
Distinction (75-100%)	57	13.6 %
First class (65-74%)	245	58.3 %
Second class (51-64%)	106	25.2 %
Fail ($\leq 50\%$)	12	2.9 %

It was found that females had performed better than males. There was no association between the academic performance and student's quota. Students belonging to nuclear family had better performance than students belonging to joint and 3 generation family. There was no association between academic performance and parents living status. Students belonging to Upper class performed better than upper-middle and lower-middle class. Students residing at home performed better than residing at paying guest, relative's house and Hostel. Students sleeping for >8hrs performed better than sleeping for <8hrs. Students who did not have English coping difficulty had performed better than who had English coping difficulty. There was no association

between academic performance and habits, education loan, family history of mental illness, relationship and relationship failure. (Table 2)

DISCUSSION

In the present study, demographic factors like gender, type of the family and socio economic status were significantly associated with student's overall academic performance. The use of gadgets (like mobiles/computer/internet), (used in leisure time) had no significant association, which is similar to a study conducted by Reddy VB et al, to assess the factors affecting the performance, in Uttarakhand, where gender had significant effect but use of gadgets (mobiles/computer/internet) had no significant association with the academic performance of the medical students.⁸

In the present study, 48 (11.4%) of the students had English language coping difficulty. Around 2.9% had secured poor marks with less than 50%, compared to a study conducted by Mandal A et al, about factors affecting the performance of undergraduate medical students, in a tertiary care hospital and Medical college in Eastern India, where 55 (36.66%) students performed poorly in the test and 14% of the study population faced difficulty in understanding the medium of instruction (English) and there was significant association of it with the academic performances and male gender had performed poor.²

In this study, place of residence had an association with the academic performance similar to a study conducted by Roy SS et al, about predictors of academic performance of medical students in Kolkata where the local aid students consistently performed better than those in hostel ($p < 0.01$).⁹

In the present study, it was found that hours of sleep are significantly associated with the academic performance of the undergraduate medical students. In a study conducted by Siraj HH et al on sleep pattern and academic performance of undergraduate medical students at university Kebangsaan Malaysia stated that respondents who slept >6 hours were observed to have significantly higher academic performance.¹⁰

In a study cross sectional study on the relationship between sleep and wake habits and academic performance in medical students by Bahammam AS et al it was found that sufficient sleep and the non-smoking status were the independent predictors of excellent academic performance.¹¹

In this study, habits like alcohol and smoking or drugs had no significant effect on the study performances. In a study by Abdulghani HM et al about the factors determining the academic performances of the students with higher performances showed that sleep deprivation, language barrier, stress etc. can play an important role in the academic outcome of the students.³

Shawwa AL et al had conducted a study on Factors potentially influencing academic performance among medical students, which showed that spending lesser time

Table 2: Association of the factors affecting the academic performances of the students

		ACADEMIC PERFORMANCE				P VALUE
FACTORS		Distinction (75-100%)	First class (65-74%)	Second class (51-64%)	Fail (≤50%)	
Gender	Female	34 (21.9%)	103(66.5%)	16 (10.3%)	2 (1.3%)	p= <0.001 df =3 *
	Male	23 (8.7%)	142 (53.6%)	90 (34%)	10 (3.8%)	
Quota	SC	2 (5.3%)	18 (47.4%)	17 (44.7%)	1 (2.6%)	p=0.120**
	ST	0	4 (50%)	4 (50%)	0	
	OBC	6 (13.6%)	29 (65.9%)	76 (23%)	0	
Family	GM	49 (14.8%)	194 (58.8%)	106 (23%)	11 (3.3%)	p=0.007**
	Joint	4 (9.1%)	18 (40.9%)	17 (38.6%)	5 (11.4%)	
	Nuclear	50 (14.4%)	211 (60.8%)	79 (22.8%)	7 (2.0%)	
Parents	3- Generation	3 (10.3%)	16 (55.2%)	10 (34.5%)	0	p=0.805**
	Single parent	2 (15.4%)	9 (69.2%)	2 (15.4%)	0	
SES	Both Parents	55(13.5%)	236 (58%)	104 (25.6%)	12 (2.9%)	p=0.012**
	Upper	32 (18.2%)	108 (61.8%)	32 (18.2%)	4 (2.3%)	
	Upper –middle	25 (10.9%)	130 (56.8%)	66 (28.8%)	8 (3.5%)	
Place of residence	Lower -middle	0	7 (46.7%)	8 (53.3%)	0	p= <0.001*
	Hostel	23 (9.4%)	147 (60%)	69 (28.2%)	6 (2.4%)	
	Paying Guest	3 (27.3%)	0	7 (63.6%)	1 (9.1%)	
	Relative's house	4 (23.5%)	6 (35.3%)	6 (35.5%)	1 (5.9%)	
Sleep	Home	27 (18.4%)	92 (62.6%)	24 (16.3%)	4 (2.7%)	p=0.034 df =3*
	< 8hrs	36 (12.7%)	165 (58.3%)	78 (27.6%)	4 (1.4%).	
Gadget use	>8 hrs	21 (15.3%)	80 (58.4%)	28 (20.4%)	8 (5.8%)	p= 0.477 df =3 *
	No	5 (10.4%)	25 (52.1%)	16 (33.3%)	2 (4.2%)	
Habits	Yes	52 (14%)	220 (59.1%)	90 (24.2%)	10 (2.7%)	p= 0.240 **
	Smoking	0	1 (50%)	1 (50%)	0	
	Alcohol	0	0	2 (100%)	0	
English coping difficulty	Nothing	57 (13.7%)	244 (58.7%)	103 (24.8%)	12 (2.9%)	p=0.016 df =3*
	No	55 (14.8%)	221 (59.4%)	86 (23.1%)	10 (2.7%)	
Education loan	Yes	2 (4.2%)	24 (50%)	20 (41.7%)	2(4.2%)	p=0.199 **
	No	56 (14.4%)	226 (58.2%)	95 (24.5%)	11 (2.8%)	
Family history of mental illness	Yes	1 (3.1%)	19 (59.4%)	11 (34.4%)	1 (3.1%)	p=0.199 **
	No	56 (13.5%)	243 (58.4%)	105 (25.2%)	12 (2.9%)	
Relationship	Yes	1 (25%)	2 (50%)	1 (25 %)	0	p= 0.644 df =3 *
	No	54 (14.1%)	223 (58.4%)	94 (24.6%)	11 (2.9%)	
Relationship failure	No	3 (7.9%)	22 (57.9%)	12 (31.6%)	1 (2.6%)	p=0.520 **

net had significant association with the academic outcome. The family size and the financial problems also had no significant association.⁷

In this study, it was found that gender, type of family, socio-economic status, place of residence, hours of sleep and language coping difficulty was found to have the statistically significant association with the academic performance. This can help in improving the academic performance among the undergraduate students by helping them with English coaching classes to cope with the difficulties to understand language, proper guidance for proper sleep and encouragement to the better

achievement. The study cannot be generalized as it includes only students from single government medical college. Conducting a multicentre study throw light on multiple factors, this further can help to improvise the academic performances of the medical students.

Conclusion:

Identifying the effect of various factors on undergraduate medical student's academic performance is of great importance. In the present study, it was found that the demographic factors like gender, type of family, socio economic status and the place of residence had a significant effect on the academic performance whereas the factors like reservation and general merit category had

no significant associations. Personal factors like hours of sleep and the English coping difficulty had association with the academic performance of the medical students. In this study, gadgets use, habits and factors causing stress and depression such as loss of parents, having relationship failure, educational loan had no significant association. By addressing the factors which affect the performance among the medical students, their performances can be improved.

Limitation: Other factors which influence the performance of the medical students were not assessed. Few students were not assessed as they were absent on the day of the study. The results cannot be generalized as study set up was limited to government medical college.

Acknowledgement: The authors are grateful to the Management and the Dean of Bangalore Medical College and Research Institute, Bengaluru for their constant encouragement to engage in research work. The authors deeply acknowledge the cooperation by the staffs and postgraduates of department of Community Medicine, BMCRI. The authors also extend their gratitude to the study participants.

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Conflict of Interest: None

Source of funding support: Nil

How to cite this article: Selvi Thangaraj, Jyothi Jadhav, Sofiya Crastha, Padmini D.B. A cross sectional study to assess the factors influencing the academic performance of the medical students in Bengaluru. *Nat J Res Community Med* 2018;7(3):178-181.

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 NJRCM: www.commedjournal.in



ORIGINAL RESEARCH ARTICLE

DOI: 10.26727/NJRCM.2018.7.3.182-185

Year: 2018 Vol: 7 Issue: 3. Jul.-Sep. Page: 182-185

Hospital Based Study: Ocular morbidity pattern among Patients attending a Private Hospital in Urban area of Kancheepuram city.(T.N.)

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Date of Submission : 21-02-2018

Date of online Publication : 07-07-2018

Date of Acceptance : 16-06-2018

Date of Print Publication : 30-06-2018

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ABSTRACT

Background: Normal vision is essential for normal physical, mental, psychological development and education. The Visual impairment is a worldwide problem that has a significant socioeconomic impact. **Objective:** To study the pattern of ocular morbidity and its association with socio-demographic variables in urban population. **Method:** Hospital based study. A retrospective study was done by reviewing the case records of all patients attending the Private Hospital at Kancheepuram city from October 2015 to February 2016. Prior permission for reviewing the recorded data was taken from the institutional Chief. The case reports of total 1613 patients was included in the study using consecutive sampling method. **Results:** Prevalence of ocular morbidity was 53.0% with a significantly higher prevalence in females than males (56.2% vs 49.1%). Refractive errors were the major ocular morbidity (86.4%) followed by cataract (22.5%). The ocular morbidity was significantly more prevalent in people aged >60 years (98.5%) than <60 years (44.3%), illiterates (75.7%) than literates (58.2%), widows/widowers (96.0%) than others (50.1), clerk/shop owner group (69.0%) than other groups (63.6%), lower class (65.2%) than other socio economic classes (52.7) and general category (57.8%) than other caste categories (36.7%). **Conclusion:** The ocular morbidity was found to be significantly associated with the literacy status, occupation, marital status, socio economic status and caste of the individuals. Measures should be undertaken to render eye health education, awareness creation and motivational programmes.

Key-words: Ocular Morbidity, Demographic variables, Social Variables, Urban Area Hospital

INTRODUCTION

Among all the senses provided by God, sense of sight is supreme. Almost 80% of our knowledge is gained through our eyes. Worldwide, approximately 285 million people are visually disabled, of whom 39 million were blind and 246 million were with low vision. And about 90% of them living in developing countries. The estimated prevalence of blindness in India for the year 2004 was about 11.2 per thousand populations. According to rapid national survey on blindness 2006-07 the prevalence rate reduced from 1.1 % to 1% and estimated national prevalence of childhood blindness or low vision was 0.8 per 1000 children. One out of every four persons in our country suffers from an eye problem at some point of time.⁽¹⁾ The eye morbidity is multi-factorial; infections, poor nutrition and certain socio-cultural factors are important in its causation. Poor hygiene and sanitation are important predisposing factors and the climatic conditions can further aggravate the eye problems. Therefore, there is a need to control the above mentioned factors for checking ocular diseases in early stages. Necessary treatment, if given in early stages, many times, prevents permanent visual disability. This warrants early detection and treatment to prevent permanent disability.

The causes of blindness vary widely in different parts of the world. Data on the prevalence of blindness and causes of blindness and severe visual impairment are needed for planning and evaluating preventive and curative services provided, including planning special education and low vision services.

Aims and Objective:

- 1) To study the pattern of ocular morbidity among patients attending a private hospital in urban area in Kancheepuram city.
- 2) To study the association of Ocular morbidity with socio demographic variables among patients attending a private hospital urban area of Kancheepuram city.

MATERIAL AND METHODS

Study Design: This was a Hospital based Retrospective cross sectional study carried out by reviewing the case records of patients attending a private hospital in urban area of Kancheepuram city.

Study Area And Population: The study is done in Private hospital which is situated in Kancheepuram city

catering a population of 164,384 of which male and female are 81,992 82,382 respectively.^(2,3) This private eye hospital gets most of the patients from this population.. A retrospective study was done by reviewing the case records of the patients attending the private eye clinic in urban area of Kancheepuram district during the duration of study period. Prior permission from the chief of the hospital for reviewing the records was taken.

Inclusion criteria: All the patients who attended the clinic for any problem during the study period were included in the study.

Exclusion criteria:- The follow up patients or old patients were excluded from the study.

Sample Size and Sampling technique: Considering the prevalence of ocular morbidity in the general population as 20%, with a relative precision of 10% of P and at confidence limits of 95%, the sample size was calculated to be 1600 using the formula ($4pq/L^2$ where $p=20$ and $q=80$ and L is 10% of p which is precision.) . Total 1613 patients case records was included in the study in 5 months period.(October 2015 to February 2016)The sampling technique followed was convenient sampling.

Study Period: To cover the sample size of 1600 study period taken was of five months from October 2015 to February 2016

Study Tool: The secondary data was collected from the Hospital records of Patients attending the hospital during the study period. The data collected was socio-demographic details and the eye disease diagnosed by the Ophthalmologic consultant of the hospital.

Statistical Analysis: The collected data was analysed using SPSS version 20 and the chi square test was used for significance of association of ocular morbidity with various socio-demographic variables.

Ethical Approval: The approval for the study was obtained from the Ethical committee of Sree Balaji Medical College and Hospital. Informed consent was obtained from the hospital chief to review the records

RESULTS

Out of 1613 individuals whose case record was included in the study, 855 (53.0%) suffered ocular morbidity. The most common morbidity was Refractive Error (86.4%), followed by Cataract (22.5%), Conjunctivitis (6.0%), Pterygium (2.6%), Squint (2.5%) and Blepharitis (1.5%). Trachoma and Entropion comprised a bare minimum of 0.2% each (Table-1). As seen in Table-2, amongst children aged <4 years, the prevalence of ocular morbidity was 1.7%. It increased significantly ($P<0.001$) with advancing age, being maximum (98.5%) in people aged ≥ 60 years. Ocular morbidity was significantly higher ($P<0.01$) in females (56.2%) than males (49.1%). In the present study subjects below 7 years of age were

excluded for studying educational status because, Census involves persons above 7 years for assessing literacy status. Table-3 depicts that the prevalence of ocular morbidity was being maximum in the illiterate group (75.7%) and minimum (51.0%) in the group educated up to fifth class. This difference in the prevalence of ocular morbidity in relation to the educational status was found to be statistically significant ($P<0.05$).

Table -1 Percent Prevalence of Ocular Morbidities.N=1613

Type of morbidity	No. of Morbidity		Percent Prevalance
	N=855		N=1613
	No	%	
Refractive Error	739	86.4	45.8
Cataract	192	22.5	11.9
Conjunktivitis	51	6	3.2
Pterigium	22	2.6	1.4
Squint	21	2.5	1.3
Blephritis	13	1.5	0.8
Glaucoma	6	0.7	0.4
Corneal Opacity	3	0.3	0.2
Stye	3	0.3	0.2
Dacryocystitis	3	0.3	0.2
Tracoma	2	0.2	0.1
Entropion	2	0.2	0.1

Table -2 Age and sex-wise distribution of morbidities

Age group	Male Attendees			Female Attendees			Total attended		
	Total	Morbid	%	Total	Morbid	%	Total	Morbid	%
0-4a*	77	2	2.6	40	0	0	117	2	1.7
5-14b*	120	20	17	117	35	29.9	237	55	23.2
15-59	413	220	53	587	323	55	1000	543	54.3
≥ 60	119	116	98	140	139	99.3	259	255	98.5
Total	729	358	49	884	497	56.2	1613	855	53

For the purpose of calculation a & b have been merged.

Age wise morbidity $\chi^2=409.00$; $df=2$; $P<0.001$.

Sex -wise morbidity $\chi^2=8.12$; $df=1$; $P<0.01$.

Table-4 denotes that ocular morbidity was significantly more ($P<0.05$) in individuals who belonged to the category of 'clerk/shop owner' (69.0%) as compared to other categories, being minimum (48.1%) in 'semiprofessional' group and in this table also children below 14 years were excluded as their occupation status cannot be ascertained as they were students. It can be seen from Table-5, that ocular morbidity was significantly related to (a)marital status, being maximum (96.0%) in widow/widower group followed by separated/ divorce group (68.2%) and married group (66.3%) and minimum (29.7%) in the unmarried group ($P<0.001$); (b) social

Table-3: Distribution of Ocular Morbidity by Educational Status.

Education	Total Population	Morbidity Population	
	No	No	%
Illiterate	115	87	75.7
Primary	257	131	51
Middle	138	76	55.1
High school	260	171	65.8
Higher Secondary.	212	137	64.6
Graduate	201	112	55.7
Post Graduate.	227	127	56
Total	1410	841	59.6

Children < 7 years (203) with 14 morbidities were excluded³. $\chi^2 = 30.28, df=6$; P value= <0.05 **Table -4: Distribution of Ocular Morbidity by Occupation.**

Occupation	Total subjects	Subjects with morbidity	
		Number	%
Unemployed	553	365	66
Non skilled worker	60	40	66.7
Semiskilled worker	72	43	59.7
Skilled worker	111	68	61.3
Clerk/shop owner	238	164	69
Semi Professional	77	37	48.1
Professional	45	31	68.9
Total	1156	748	64.7

*Children <14 years(457) with 107 morbidities were excluded.

 $\chi^2=13.4$; $df=6$; $P=<0.05$ **Table-5: Relation of ocular morbidity with marital status, social class and caste.**

Social Variables	Total (n=1613)	Individuals with Morbidity	
		No	%
Marital Status			
Married	820	544	66.3
Unmarried	670	199	29.7
Widow/Widower	101	97	96
Seperated/Divorced	22	15	68.2
P=<0.001			
Socio-economic status			
Upper	90	50	55.6
Upper Middle.	775	433	55.9
Lower Middle.	461	237	51.4
Upper Lower	264	120	45.5
Lower	23	15	65.2
P=<0.05			
Caste			
General	1248	721	58
Other backward classes.	197	76	38.5
Scheduled caste/Scheduled tribes	168	58	34.5
P=<0.01			

class being maximum (65.2%) in lower class and minimum (54.1% each) in upper lower and lower middle

classes ($P<0.05$) and (c) caste, being maximum (57.8%) in general category, followed by other backward classes (38.6%) and scheduled caste/scheduled tribe (34.5%) ($P<0.01$).

DISCUSSION

In this study, the prevalence of ocular morbidity was found to be 53.0%, which is higher than 40.38 % found at a study done by Dr Amol Khadse, Dr Uday Narlawar et al. in central india ⁽⁴⁾. Similar prevalence of ocular morbidities were observed by study done by Rajesh Gattani. (42.3%)⁽⁵⁾ and study done by Madhu Sharma *et al.* (40%)⁽⁶⁾. In the present study, the prevalence of ocular morbidity was found to be significantly associated with age which is in agreement with the findings of the studies done by Gulati N *et al.* ⁽⁷⁾, Titiyal JS *et al.*⁽⁸⁾, Dandona L *et al.* ⁽⁹⁾ and Asole S *et al.*⁽¹⁰⁾.

Children (0-14 years) in this study, had an ocular morbidity of 30.1% which is higher than 10.9% reported in the study done by Mukherji .PS at West Bengal.⁽¹¹⁾ and 22.7% in a study done by Kumar .R, Mehra.M and Kamlesh at Delhi⁽¹²⁾. The ocular morbidity in the geriatric age group, in this study, was 98.5%, which is in approximate agreement to 100% in a study done by Gulati N et al at Delhi⁽⁷⁾ and 90.62% found in studies done by reasons. Ocular Asole et al at Aurangabad⁽¹⁰⁾. The higher prevalence of ocular diseases in old age could be due to increasing degenerative conditions, increased susceptibility to infections, lack of proper care of the eyes, among other morbidity was found to be significantly higher in the females as compared to males ($P<0.01$), which was similar to the findings of the study done by Asole et al.⁽¹⁰⁾ However the study done by Dr Amol Khadse, Dr Uday Narlawar et al. in central india ⁽⁴⁾ also showed higher prevalence of ocular morbidity in females than males but this difference was not significant.

In the present study, the ocular morbidity was found to be significantly associated ($P<0.001$) with literacy status being maximum in illiterates. A Delhi based study done by Sreehari.Y.R, Gulati PV.also observed the same. Also study done by Dr Amol Khadse, Dr Uday Narlawar et al. in central India⁽⁴⁾ also supports the significant association of literacy status with ocular morbidity. Ocular morbidity was found to be significantly associated with occupation ($P<0.05$) with the highest morbidity prevalence in the clerk/shop owner group and professionals. This finding can be explained due to higher educational status of the working group as professionals.

In the present study, widows/widowers had the maximum prevalence of ocular morbidity while unmarried (yet to get married) people had the least prevalence and this association was highly significant ($P<0.01$). This observation is explained on the basis of higher ocular morbidity (already discussed) with increasing age.

The ocular morbidity was found to be significantly associated with socio-economic status ($P<0.05$) being highest in the lower socio-economic group (class V), which was similar to the findings of the studies conducted by Asol et al at Aurangabad⁽¹⁰⁾, also in study done by Kumar .A, Mittal.S.Gupta.A and Garg .S.K. at Meerut⁽¹⁴⁾

and Dr Amol Khadse, Dr Uday Narlawar et al. study in central india⁽⁴⁾

Ocular morbidity was significantly more prevalent ($P < 0.05$) in the general category as compared to OBCs and SC/ST categories in the present study. Similar findings were observed in the study done by Sharma J.L., Lal S, Chauhan B.S., Singh M and Singh I at Haryana ⁽¹⁵⁾. The higher ocular morbidity in this category may be because of the better health seeking behavior and consequently more frequently diagnosed ocular morbidity in this category

Conclusion:-The prevalence of ocular morbidity was found to be 53.0% in the population with a significantly higher prevalence in females than males. The ocular morbidity was found to be significantly associated with the literacy status, occupation, marital status, socio economic status and caste of the individuals. Measures should be undertaken to render eye health education, awareness creation and motivational programmes in the community including parents, senior school students and the primary school teachers with active participation and involvement of community organizations like youth clubs, women organizations, religious leaders etc. The importance of first eye check-up in children at the age of five years should be emphasized to the parents, the aged as well as the population as a whole should be educated and told about the benefits of screening for eye problems. School health programmes should be strengthened to carry out screening and proper management of eye problems in children

Acknowledgement:- It is proud privilege to record my heartfelt gratitude and indebtedness to my esteemed teacher Dr R Umadevi, Professor Department of Community Medicine, Sree Balaji Medical college, Chennai who able guidance, untiring constant supervision, sympathetic attitude and encouraging polite expressions are really unforgettable. I am equally indebted to Professor Dr.J.Krishnakumar for his kind suggestion and technical know how in setting up this work. My sincere thanks to the chief of the Eye Hospital for permitting me to collect the required data for completing the study. I also thank them whose names have not been mentioned but have stood to my cause, rendered me unconceivable help at every step of my work.

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Conflict of Interest: None

Source of funding support: Nil

How to cite this article: Rashmi Gour Patel, S .Gopalkrishnan, Sunil Patel. Hospital Based Study: Ocular morbidity pattern among Patients attending a Private Hospital in Urban area of Kancheepuram city.(T.N.). Nat J Res Community Med 2018;7(3):182-185.

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ORIGINAL RESEARCH ARTICLE

DOI: 10.26727/NJRCM.2018.7.3.186-189

Year: 2018 Vol: 7 Issue: 3. Jul.-Sep. Page: 186-189

Domestic Violence Against Married Women In RHTC, Kasturwadi : A Community Based Cross Sectional Study

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Date of Submission : 30-04-2018

Date of online Publication : 07-07-2018

Date of Acceptance : 19-06-2018

Date of Print Publication : 30-06-2018

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ABSTRACT

Introduction: In the recent times, violence against women is an emerging problem both in the developed and developing countries, with the World Health Organization (WHO) declaring domestic violence as a “public health epidemic.”

Objectives 1. To study the prevalence of domestic violence by intimate partner against married women. 2. To study the socio-demographic factors which affect the victimization of woman for domestic violence.3. To study the reaction of women to domestic violence. **Materials and methods:** A cross sectional study was conducted in Kasturwadi village under Rural Health Training Centre , JIIU's Indian Institute of Medical Science and Research, Badnapur on all married woman residing in Kasturwadi from August to December 2016. A well designed, pre- tested questionnaire was prepared in local language was administered to collect data. Data was analysed using epi info. and presented in suitable tables; percentages were calculated and chi-square test was applied to test statistical significance where ever necessary. **Results:** Domestic violence was observed in 77(39.89%) of them. They were physical (21.76%), verbal (21.76%) and sexual (1.55%). Alcohol consumption was seen in 52(26.94%). Domestic violence was more common among women less than 30 years, illiterate, Hindu, employed in semiskilled and skilled occupation, married early, duration of married life < 5years , illiterate spouse, unemployed spouse and spouse consuming alcohol. **Conclusion:** It was seen that the prevalence of domestic violence was high in the rural area of Maharashtra. It was associated with less education, early marriages and alcohol consumption by the spouse.

Key-words: domestic violence, rural women, physical violence

INTRODUCTION

In the recent times, violence against women is an emerging problem both in the developed and developing countries, with the World Health Organization (WHO) declaring domestic violence as a “public health epidemic.” World Health Organization (WHO) has defined domestic violence as “the range of sexually, psychologically and physically coercive acts used against adult and adolescent women by current or former male intimate partners”¹. Nevertheless, DV shows particular forms and patterns depending on the local context and recognized as an important public health problem. Despite the range of abuse, it is the most common cause of nonfatal injury to women, who suffer, blame themselves, and choose not to report it. In fact, often rationalize and internalized the abuse by believing that the act was provoked by the women, therefore, justify and accept it as their fate, to continue living with it². Violence not only causes physical injury, it also undermines the social, economic, psychological, spiritual and emotional well being of the victim, the perpetrator and the society as a whole. Domestic violence is a major contributor to the ill health of women³.

According to the WHO, globally more than one-third of women are suffering physical and sexual violence, with a lifetime prevalence of violence ranging from 10% to 69% from different population surveys⁴. As per National Family Health Survey-4 report in India 28.8% of the ever married women have experienced some form of spousal violence⁵. According to the same survey 21.4% of the ever married women in Maharashtra have experienced some form of spousal violence⁶.

Government of India has made serious effort in curbing the problem of domestic violence by the formation of Protection of women from domestic violence act, 2005, which stated that any act, conduct, omission and commission that harms or injures or has a potential to harm or injure will be considered as domestic violence by the law⁷.

The cycle of domestic violence is repeated across generations. It can be clearly stated from previous studies that rural women with low educational and social status are more prone for domestic violence⁷.

No such study was done in this area thus this study was conducted to estimate the actual prevalence, the socio-

demographic factors and immediate reaction of study participants to domestic violence.

Objectives

To study the prevalence of domestic violence by intimate partner against married women.

To study the socio-demographic factors which affect the victimization of woman for domestic violence.

To study the reaction of women to domestic violence.

MATERIALS AND METHODS

The study design was a cross sectional study conducted in Kasturwadi village under Rural Health Training Centre, JIU's Indian Institute of Medical Science and Research, Badnapur . The study was conducted on all married woman residing in Kasturwadi . Married woman now divorced /separated were excluded from the study. The Study was conducted from August to December 2016. The list of all married women in the village was made with the help of the register maintained in the health center. Data was collected from married woman by house to house visit. Considering the topic adequate privacy was maintained. In case the woman was not present at home at the time of visit then she was revisited to collect data. Even after three visits if the woman could not be interviewed then that particular woman was excluded from the study. Written informed consent was obtained for the data collection. A well designed, pre- tested questionnaire was prepared in local language was administered to collect data. The questionnaire consisted of questions of socio demographic characteristics of the women, marital characteristics, types of domestic violence if she had experienced any and reaction of the woman towards domestic violence. The operational definition of domestic violence used during this study was any physical violence which included slapping, throwing any object on the women, pushing or beating , sexual violence , verbal violence or psychological violence on the women by the spouse at any time in their life. Institutional ethical clearance was obtained. Data was analysed using epi info. and presented in suitable tables; percentages were calculated and chi-square test was applied to test statistical significance where ever necessary.

RESULTS

Table no 1 shows that majority of the study participants were in the age group of less than 30 years, illiterate, doing unskilled occupation and Muslim by religion. It can be observed from table no 2 that most of the study participants got married before the age of 18 years. Majority of the spouse were in the age group of 20 -22 years during their wedding, most of them studied upto high school, most of them were farmers. Alcohol consumption was seen in 52(26.94%). Domestic violence was observed in 77(39.89%) of them. Table no 3 shows the various types of violence faced by the women. They were physical (21.76%), verbal (21.76%) and sexual (1.55%). Slapping was the most common form of

physical violence. The most common type of injury was bruising followed by contusion then cuts. From table no 4 it can be observed that most of the woman had a feeling of powerlessness to violence. It can be inferred from table no 5 that domestic violence was more common among women less than 30 years , illiterate, Hindu, employed in semiskilled and skilled occupation, married early, duration of married life < 5years , illiterate spouse, unemployed spouse and spouse consuming alcohol.

Table 1: Type of violence faced by women.

Type of violence	Frequency	Percentage
Physical	42	21.76%
Slapping	39	20.21%
Throwing	14	7.25%
Pushing	24	12.44%
Beating	35	18.13%
Sexual	3	1.55%
Verbal	42	21.76%
Psychological	39	20.21%
Type of Injuries		
Bruising	40	20.72%
Contusion	35	18.13%
Cuts	2	1.04%

Table 2: Response of study subjects to any of the violence.

Reaction of Women	Frequency (N=77)	Percentage
Revenge	31	40.25%
Powerlessness	35	45.45%
Resisted	11	14.28%

DISCUSSION

It was seen in this study that 39.89% of the married women experienced domestic violence which was similar to a study done by Sandeep Shah⁸ which showed a prevalence of 32.3%. The National Family Health Survey (NFHS-4) reported a burden of domestic violence as 26.2% among ever-married women in the reproductive age group in rural Maharashtra⁶. The national average⁵ for rural areas was 31.2%. Many studies reported domestic violence with varying prevalence 21.2% by Shahina begum⁹, 26.6% by Kamat U¹⁰, 45.2% by Ruikar MM¹¹, 47.2% by Ashok Mishra¹² , 54% by Sinha Begum¹³ , 56.7% by Jismar George⁴. It was observed that the prevalence of violence varied from place to place in India. The explanation could be the difference in the distribution factors in the populations studied such as age, issues in the definition and measurement of partner violence, and willingness to report their experience of violence⁹. Women are often reluctant to reveal their domestic violence status due to shame, fear of ridicule and reprisal by family and friends or belief that no one will understand their plight.¹⁴

Table 3: Factors associated with domestic violence among study subjects

Factors	Domestic Violence(%)	No Domestic Violence(%)	Total (%)	P Value
Age (in years)				
< 30	38(43)	51(57)	89(46)	0.52
31-39	23(40)	35(60)	58(30)	
40-49	15(38)	24(62)	39(20)	
50 >50	1(14)	6(86)	7(3.6)	
Education				
Illiterate	38(53)	34(47)	72(38)	0.03
Primary and middle school	12(39)	19(61)	31(12)	
High school	20(30)	46(70)	66(20)	
Higher secondary / Diploma, Graduate and above	7(29)	17(71)	24(17)	
Employment status				
Unemployed	2(40)	3(60)	5(2.5)	0.04
Unskilled	28(32)	59(68)	87(28)	
skilled/Semiskilled	20(60)	13(39)	33(17)	
Farmer/shopowner/clerk	27(40)	41(60)	68(35)	
Religion				
Hindu	27(48)	29(52)	56(29)	0.29
Muslim	49(36)	86(63)	135(70)	
Christian	1(50)	1(50)	2(1.04)	
Age at marriage				
< 18 years	50(44)	62(55)	112(58)	0.05
>18 years	27(33)	54(66)	81(42)	
Duration of marriage (years)				
0-5	25(58)	18(41)	43(22)	0.007
10-May	18(40)	26(59)	44(23)	
15-Oct	12(37)	20(62)	32(17)	
15-20	8(26)	22(73)	30(15)	
20-25	14(31)	30(68)	44(23)	
Spouse's education				
Illiterate	20(52)	18(47)	38(20)	0.34
Primary and middle school	11(39)	17(60)	28(15)	
High school	29(38)	47(61)	76(39)	
Higher secondary	15(36)	26(63)	41(21)	
Diploma	1(25)	3(75)	4(2.1)	
Graduate and above	1(16)	5(83)	6(3.1)	
Spouse's employment status				
Unemployed	2(100)	0(0)	2(1.0)	0.39
Unskilled	1(33)	2(66)	3(1.5)	
Semiskilled	3(30)	7(70)	10(5.2)	
skilled	19(48)	20(51)	39(20)	
Farmer/shop owner/clerk	50(37)	83(62)	133(69)	
Semiprofessional	2(33)	4(66)	6(3.1)	
Alcohol				
Yes	44(84)	8(15)	52(27)	0
No	33(23)	108(76)	141(73)	

The most common type of violence seen in the present study was physical (21.76%) and verbal (21.76%) followed by psychological (20.21%) then sexual violence (1.55%). Similar finding were observed by Sandeep Shah⁸ who showed emotional violence of 25.3%, physical (19.6%) , economic violence (11.3%) followed by sexual violence(2%). Shahina Begum⁹ showed physical violence (16.8 %), emotional violence of 12.4% followed by sexual violence(4.8%). Few studies showed a high prevalence of psychological abuse 54.5% by Ray K¹⁵, 52% by Babu BV¹⁶ and 51.3% by Jismar George⁴.

It was found in our study that women who were married early experienced more domestic violence this finding was consistent with the finding of Shahina begum⁹, Erulkar A¹⁷ , Santhya KG¹⁸ and Testa M¹⁹. In our study it was seen that the domestic violence was more common in the age group of <30 years. In a study done by Ashok Mishra¹² domestic violence was more common in the age group of 26-30years followed by 20- 25 years.

In our study women doing semiskilled and skilled work experienced more domestic violence similar association was seen by Shahina Begum⁹ and Kishnan S²⁰. According to Ashok Mishra¹² and Babu BV¹⁶ domestic violence was more among housewives. It was observed in our study that prevalence of domestic violence was more among illiterates similar findings were observed by Ashok Mishra⁴, Kimuna²¹, Kamat U¹⁰, Kamlesh Kumari Sharma¹⁴ and Jismar George⁴. Our study found that low education status of the spouse was associated with domestic violence similar finding were observed by Kamlesh Kumari Sharma¹⁴.

Alcohol consumption by the spouse was significantly associated with domestic violence in our study .Similar findings were observed in various studies done by Ashok Mishra⁴, Kamlesh Kumari Sharma¹⁴, Mahapatrao M², Sinha A¹³, Kamat U¹⁰, Testa M¹⁹, Sandeep Shah⁸ and Kimuna²¹.

Conclusion

It was seen that the prevalence of domestic violence was high in the rural area of Maharashtra. It was associated with less education, early marriages and alcohol consumption by the spouse. It is recommended that the literacy level in the society especially in the rural areas should be improved, legislations should be strictly enforced to avoid early marriages and women should be informed about the various help line numbers and laws to protect themselves from domestic violence.

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Conflict of Interest: None

Source of funding support: Nil

How to cite this article: Sujata Muneshwar, Mohammad Shafee, Gautam Madhavrao Bhaware, Kashinath Deshmane. Domestic Violence Against Married Women In RHTC, Kasturwadi : A Community Based Cross Sectional Study. *Nat J Res Community Med* 2018;7(3):186-189.

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NJRCM: www.commedjournal.in



ORIGINAL RESEARCH ARTICLE

DOI: 10.26727/NJRCM.2018.7.3.190-195

Year: 2018 Vol: 7 Issue: 3. Jul-Sep. Page: 190-195

TOBACCO USE AMONG GOVERNMENT MEDICAL STUDENTS OF LUCKNOW: NEED OF FORMAL CESSATION TRAINING

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Date of Submission : 30-04-2018

Date of online Publication : 07-07-2018

Date of Acceptance : 19-06-2018

Date of Print Publication : 31-07-2018

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ABSTRACT

Introduction: According to WHO report “Global Action Plan for the prevention and control of Non-communicable diseases 2013 – 2020”, the target was 30% reduction in prevalence of current tobacco use in persons aged 15+ years. With this background this study was undertaken to determine the current prevalence of tobacco intake by medical students in Lucknow. **Material & Methods:** A cross-sectional study was conducted among medical undergraduate students of a government medical College in Lucknow, Uttar Pradesh, between November 2017 to February 2018, after taking ethical approval from institutional ethical committee. Selected students were asked to fill a predesigned pretested questionnaire after taking written informed consent. The data collected was analyzed using SPSS version 23. **Results:** Out of a total of 200 students, 7% of students admitted of using tobacco currently while 5.5% admitted of using it in the past and had quit it. 18% of respondents had experimented tobacco use once. Among the current users, a higher proportion (57.1%) used tobacco in smoked form while remaining (42.9%) used in smoked and chewed form both. Male gender, history of tobacco use among parent(s), friends and roommates were found significant predictors to current tobacco use. **Conclusions:** Medical students need to undergo formal tobacco cessation training. Tobacco cessation clinics are needed in all institutions to support the control of tobacco use.

Key-words: Tobacco use, government, medical students, Lucknow, cessation training

INTRODUCTION

In India, tobacco use among children and youth is quite high. The Global Youth Tobacco Survey (GYTS) 2006 revealed that the prevalence of current use of tobacco among 13–15-year-olds is 14%. GATS 2 revealed that 28.6 percent (266.8 million) of adults in India, aged 15 and above currently use tobacco in some form. Among the adults 24.9 percent (232.4 million) are daily tobacco users and 3.7 percent (34.4 million) are occasional users. The mean age at initiation of tobacco use is 18.9 years in GATS 2. ¹

Indian Studies among students across the Indian metropolises provide variable estimates of the current use of tobacco from as low as 4% in Mumbai to as high as 41.1% in Chennai. ² According to WHO report on Global Tobacco Epidemic 2017 – country profile, India, the total adult current tobacco smoking was found to be 14.0% and Daily tobacco smoking was found to be 10.7%. If current trends continue tobacco will account for 13 percent of all deaths in India by 2020. ³ According to WHO report “Global Action Plan for the prevention and control of Non-communicable diseases 2013 – 2020”, the target was 30% reduction in prevalence of current tobacco use in persons aged 15+ years. ⁴ Despite their important roles as future doctors in tobacco cessation counselling, the high prevalence of tobacco use among medical students may

hinder them from advocating tobacco control policies and providing cessation counselling. ⁵ With this background this study was undertaken to determine the current prevalence of tobacco intake by medical students in Lucknow and to identify the various socio-demographic factors associated.

MATERIAL & METHODS

A cross-sectional study was conducted among medical undergraduate students of a government medical College in Lucknow, Uttar Pradesh, between November 2017 to February 2018, after taking ethical approval from institutional ethical committee of King George’s medical University UP, Lucknow. Sample size was calculated by taking prevalence as 7.2%, with two side alpha at 95%, allowable error at 4%, and assuming 20% non-response rate, a minimum sample of 195 students was required for achieving primary objective which was rounded off to 200 students. Students were chosen randomly from attendance register until sample size was achieved; Equal number of students were chosen from each batch. Selected students were asked to fill a predesigned pretested questionnaire after taking written informed consent. The questionnaire was explained to them in

Table 1 : Distribution of Socio-demographic variables according to the status of tobacco usage among students

VARIABLES		Tobacco Products				Total
		Using Currently	Used In Past And Left	Yes, experimented Once	Never	
Age	<22	8	8	26	92	134
		-57.10%	-72.70%	-72.20%	-66.20%	-67.00%
	>22	6	3	10	47	66
		-42.90%	-27.30%	-27.80%	-33.80%	-33.00%
Gender	Male	12	10	18	72	112
		-85.70%	-90.90%	-50.00%	-51.80%	-56.00%
	Female	2	1	18	67	88
		-14.30%	-9.10%	-50.00%	-48.20%	-44.00%
MBBS Course Year	I	1	5	11	33	50
		-7.10%	-45.50%	-30.60%	-23.70%	-25.00%
	II	1	2	11	36	50
		-7.10%	-18.20%	-30.60%	-25.90%	-25.00%
	III	6	2	6	36	50
		-42.90%	-18.20%	-16.70%	-25.90%	-25.00%
	IV	6	2	8	34	50
		-42.90%	-18.20%	-22.20%	-24.50%	-25.00%
Current Residence	Home	0	0	2	9	11
		0.00%	0.00%	-5.60%	-6.50%	-5.50%
	Hostel	14	11	34	130	189
		-100.00%	-100.00%	-94.40%	-93.50%	-94.50%
Sharing Of Room	No	2	0	3	30	35
		-14.30%	0.00%	-8.30%	-21.70%	-17.60%
	Yes	12	11	33	108	164
		-85.70%	-100.00%	-91.70%	-78.30%	-82.40%
History Of Tobacco Use	Parent	6	6	22	109	143
		-42.90%	-54.50%	-61.10%	-78.40%	-71.50%
		8	5	14	30	57
		-57.10%	-45.50%	-38.90%	-21.60%	-28.50%
	Friends	7	7	30	109	153
		-50.00%	-63.60%	-83.30%	-78.40%	-76.50%
		7	4	6	30	47
		-50.00%	-36.40%	-16.70%	-21.60%	-23.50%
	Roommate	7	10	35	129	181
		-50.00%	-90.90%	-97.20%	-92.80%	-90.50%
		7	1	1	10	19
		-50.00%	-9.10%	-2.80%	-7.20%	-9.50%
SES as per Modified Prasad Classification	I	6	7	16	56	85
		-42.90%	-63.60%	-44.40%	-40.30%	-42.50%
	II	0	1	9	36	46
		0.00%	-9.10%	-25.00%	-25.90%	-23.00%
	III	5	1	5	16	27
		-35.70%	-9.10%	-13.90%	-11.50%	-13.50%
	IV	3	2	6	31	42
		-21.40%	-18.20%	-16.70%	-22.30%	-21.00%
Total		14	11	36	139	200
		-7.00%	-5.50%	-18.00%	-69.50%	-100%

detail. Filled questionnaire were checked for completeness and incomplete forms were excluded from the study.

Data was collected for sociodemographic characteristics. Following operational definitions were used in the study.

“Current use” was defined as having used tobacco at regularly in the last 30 days preceding the survey. “Never use” was defined as having not used tobacco even once in their lifetime.

“Past use” was defined as use of tobacco in past regularly but not consumed the tobacco product in past 30 days preceding the survey “Experimented once” was defined tried tobacco product once in last 3 years.

The data collected was tabulated, coded, and analyzed using Microsoft Excel and SPSS version 23 by IBM for Windows, discreet data was presented in numbers and percentage, continuous data was recorded in median and interquartile range, for all the tests, P -value <0.05 was considered significant. Predictors for current tobacco use against current nonuse was determined using binary logistic regression by enter model.

RESULTS

A total of 200 students participated in the study with 112 (56.0%) males and 88 females (44.0%). Majority of respondents were aged less than 22 years (67.0%) and were hostellers (94.5%). A total of 7% of students admitted of using tobacco currently while 5.5% admitted of using it in the past and had quit it. 18% of respondents had experimented tobacco use once. Among the current users prevalence of tobacco use was found higher among the 3rd (42.9%) and 4th year (42.9%) students as compared to the 1st (7.1%) and 2nd year (7.1%) ones. All the current users were hostellers as compared to none who resided at home. Majority (85.7%) of the current users were living in a shared room. A higher proportion (42.9%) of the current users belonged to upper socioeconomic class (Table 1)

Table 2: Distribution of characteristics of students who had experimented tobacco use once

Characteristics		N(36)	%
Reason for Trying Tobacco Product	Peer Pressure	10	27.8%
	To Boost Confidence	1	2.8%
	To Relieve Stress	2	5.6%
	Just for fun	2	5.6%
Type of Tobacco Product Tried	Smoked Tobacco	29	80.6%
	Chewing Tobacco	7	19.4%
Willingness To Try Tobacco Product Again	Never	25	71.4%
	May Be	10	28.6%

Out of 200 36 (18.0%) students had experimented tobacco use once. Majority of them had done it under peer pressure (27.8%) and had used it in smoked form (80.6%). Nearly 28.6% of students who had experimented tobacco use in the past still showed willingness to use tobacco in future. (Table 2)

Table 3: Distribution of characteristics of past tobacco users

PAST USERS		N (11)	%/ Median (IQR)
Tobacco Product	Chewed	3	27.3%
	Smoked	8	72.7%
Initiated tobacco abuse*	Mood elevation	8	72.7%
	To boost image	1	9.1%
	To clear bowels	1	9.1%
	No response	1	9.1%
	Headache	2	18.2%
	Shortness of breath	1	9.1%
Withdrawal Symptoms*	Irritability	1	9.1%
	Insomnia	2	18.2%
	Loss of appetite	1	9.1%
	Other	2	18.2%
Method adopted for quitting tobacco use*	Self-Decision	6	54.5%
	No response given	5	45.5%

*Multiple Response

Among the past users, majority (72.7%) had used tobacco in smoked form. Most (72.7%) of the past users had initiated tobacco use to elevate their mood. A higher proportion of the students reported withdrawal symptoms like headache (18.2%) and insomnia (18.2%) etc. A higher proportion (54.5%) of past users had quit the habit by self decision.(Table 3)

Table 4: Distribution of characteristics of current users of tobacco products.

CURRENT USERS		N (14)	% / Median (IQR)
Type of tobacco abused	Smoked	8	57.1%
	Chewed and smoked	6	42.9%
Quantity (cigarettes) (Smoked Tobacco)	used per day	12	4.5 (4.0 – 10.0)
Quantity (packets) (Chewed Tobacco)	used per day	6	2.5 (2.0 – 5.5)
Duration since using (in years)		14	5.0 (2.75 – 6.25)
Tobacco abuse occasionally(cigarette)		2	25.0%
	Mood elevation	6	42.9%
Initiated tobacco abuse*	To boost image	7	50.0%
	To clear bowels	1	7.1%
	Peer pressure	4	28.6%
	Feels Good	6	42.9%
Reasons for continuing tobacco abuse*	For relieving Stress	4	28.6%
	No Response	4	28.6%
Tried quitting tobacco abuse (past 12 months)		8	57.1%
			14.5 (8.75 – 318.75)
Duration of quitting (in days)		8	4.5 (2.25 – 6.5)
Number of times attempted to quit tobacco		8	4.5 (2.25 – 6.5)
Person who influenced to quit smoking*	Self	8	57.1%
	Friends	3	21.4%
	Parents	2	14.3%

Way tried for quitting*	Others	1	7.1%
	Nicotine chewing gums	1	7.1%
	Will power	8	57.1%
Reason for restarting tobacco Abuse*	Craving	6	42.9%
	Triggers	2	14.3%
	Withdrawal symptoms	1	7.1%
Symptoms*	Stress	2	14.3%
	Headache	4	28.6%
	Shortness of breath	3	21.4%
	Persistent cough with sputum	1	7.1%
	Bad breath	3	21.4%
	Tooth loss	1	7.1%
	Irritability	3	21.4%
	Pain in legs on walking	1	7.1%
	Oral ulcers	3	21.4%
	Insomnia	2	14.3%

*Multiple Response

Among the current users, a higher proportion (57.1%) used tobacco in smoked form while remaining (42.9%) used in smoked and chewed form both. Most of the current users initiated tobacco use to boost image (50.0%) followed by elevation of mood (42.9%) and peer pressure (28.6%). The most common reason cited for continuing the habit was feeling of goodness (42.9%) . Nearly 57.1% had tried quitting tobacco in the past 12 months. The most common way tried for quitting was will power (57.1%). The most common reason for restarting tobacco abuse was craving (42.9%). The common symptoms reported by the current tobacco users were headache (28.6%), shortness of breath (21.4%), bad breath (21.4%), irritability (21.4%), oral ulcers (21.4%) and insomnia (14.3%) (Table 4).

Current Tobacco use was 5.1 times more common among males than females, 3.7 times more common among those who had a history of tobacco use among parent(s) than among those whose parent(s) did not smoke, 3.6 times more common whose friends used tobacco as compared to those whose friends did not use tobacco and 14.5 times more common among those whose roommates used tobacco as compared to those who did not. (Table 5)

DISCUSSION

A total of 7% of students admitted of using tobacco currently while 5.5% admitted of using it in the past and had quit it. 18% of respondents had experienced tobacco use once. Previous studies from India which were conducted among undergraduate medical students had reported a prevalence of tobacco use of between 8.0%-50.0%.⁶⁻¹²

Among the current users prevalence of tobacco use was found higher among the senior students as compared to junior ones. Our findings are coherent to those reported among the medical students of Orissa , Bareilly, and Lahore^{9,13, 14}

Table 5: Predictors of current use of tobacco products among students.

VARIABLES	Univariate Analysis		Multivariate Analysis	
	OR	CI	Adjusted OR	CI
Age (> 22)	0.635	0.211 - 1.912	-	-
Age (< 22)	Ref		-	-
Gender (Male)	5.16	1.124 - 23.698	5.889	1.135 - 30.552
Gender (Female)	Ref			
Type of Family (Joint)	2.542	0.845 - 7.642	-	-
Type of Family (Nuclear)	Ref		-	-
Background (Rural)	1.882	0.623 - 5.684	-	-
Background (Urban)	Ref		-	-
Sharing of Room (Yes)	1.342	0.287 - 6.276	-	-
Sharing of Room (No)	Ref		-	-
History of tobacco use in parent (Yes)	3.728	1.231 - 11.285	2.506	.732 - 8.582
History of tobacco use in parent (No)	Ref			
History of tobacco use in Other family members (Yes)	0.981	.208 - 4.631	-	-
History of tobacco use in Other family members (No)	Ref		-	-
History of tobacco use among Friends (Yes)	3.65	1.210 - 11.015	-	-
History of tobacco use among Friends (No)	Ref		-	-
History of tobacco use among Roommate (Yes)	14.5	4.368 - 48.137	12.837	3.542 - 46.517
History of tobacco use among Roommate (No)	Ref			

The prevalence of experimental use of tobacco was 18.0% among medical students in our study. Experimental use of tobacco significantly increased from 24% in 2007 to 42% among males and similarly among females, 3.3% in 2007 and 11.2% in 2013 in a south Indian study.¹⁵ Nearly a quarter of students who had experimented tobacco use in the past still showed willingness to use it in future. It is not clear whether students who have experimented with smoking in the past, will transit to regular use in the future in the face of the efforts of the tobacco industry to reach new markets with the aid of multiple traditional gimmicks to lure youth.^{16,17} The industry envisions the uptake of smoking as a process that extends into young adulthood, during which time adolescents' experimental or occasional smoking becomes solidified into a regular smoking habit.¹⁸

Factors such as increased psychosocial risk, key socioeconomic factors, external environment and continuing lack of access to tobacco control education could lead to greater vulnerability among students who have experimented with smoking in the past.¹⁵

Among the current users, a higher proportion (57.1%) used tobacco in smoked form while remaining (42.9%) used in smoked and chewed form both. Warren et al (2008) reported that in 47 out of 80 global health professional students' survey sites around the world, over 20% of the medical students currently smoked cigarettes; and that in 29 of 77 sites, over 10% of the medical students currently used other tobacco products.¹⁹

Nearly 57.1% had tried quitting tobacco in the past 12 months and the most common reason for restarting tobacco abuse was craving (42.9%) in this study. Craving is a core feature of tobacco use disorder as well as a significant predictor of smoking relapse. Studies have shown that appetitive smoking-related stimuli (e.g., someone smoking) trigger significant cravings in smokers impede their self-control capacities and promote drug seeking behavior.²⁰

Nearly a quarter of medical students in this study had experienced health problems after tobacco use. About 14.13% of the medical students of Bareilly had suffered from a health problem since they had started consuming tobacco.¹³

Current Tobacco use was more common among males, who had a history of parent tobacco use, whose friends used tobacco and among those whose roommates used tobacco in the present study. Lower prevalence of tobacco use among females as compared to males can be attributed to its social unacceptability for females. It has been reported that parent smoking contributes to the onset of daily smoking in their teenagers even if parents practice good family management, hold norms against teen tobacco use, and do not involve their children in their own tobacco use. Smoking prevention programs should include components focused on parents.²¹ Students residing in environment of hostels with sharing rooms are more vulnerable to experiment tobacco use out of peer pressure or just for fun. Medical students being role models of the society, should be encouraged not to experiment tobacco use. Indeed, medical students in our study need to undergo formal tobacco cessation training. In a recent study, 125 undergraduate medical students received a multimodal and interactive teaching module on smoking cessation and an objective structured clinical examination at the end of the module and 6 months later. Results were compared to data obtained from a historical control cohort ($n = 70$) unexposed to the intervention. At the 6-month follow-up, scores were significantly higher in the intervention than the control group (71.5% vs. 60.5%; $p < .001$).²² In another model, 10 U.S. medical schools in a group-randomized controlled trial were evaluated to find whether a multi-modal educational (MME) intervention compared to traditional education (TE) will improve observed tobacco

treatment skills. MME is primarily composed of TE approaches (i.e. didactics) plus a 1st year web-based course and preceptor-facilitated training during a 3rd year clerkship rotation. It was hypothesized that MME intervention will better prepare students in tobacco dependence treatment as measured by the OSCE.²³ Medical education curricula and policies focused on increasing knowledge of tobacco health hazards and smoking cessation, while also aiming to decrease medical student tobacco consumption rates, stand to improve global tobacco-related public health.²⁴

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- Conflict of Interest: None**
Source of funding support: Nil
- How to cite this article:** Naim Ahmad, Syed Esam Mahmood, Aparna Jain, Shikhar Singh, MZ IDRIS, Manish Manar, SK Singh. Tobacco Use Among Government Medical Students Of Lucknow: Need Of Formal Cessation Training. *Nat J Res Community Med* 2018;7(3):196-195.
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 NJRCM: www.commedjournal.in



ORIGINAL RESEARCH ARTICLE

DOI: 10.26727/NJRCM.2018.7.3.196-201

Year: 2018 Vol: 7 Issue: 3. Jul.-Sep. Page: 196-201

Impact of lifestyle on obesity among rural adults in Kancheepuram District of Tamil Nadu, India

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Date of Submission : 09-06-2018

Date of online Publication : 07-07-2018

Date of Acceptance : 02-07-2018

Date of Print Publication : 30-06-2018

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ABSTRACT

In developing countries like India, non-communicable diseases are emerging to become major causes of morbidity, mortality and disability, in both urban and rural areas alike. One of the key risk factors for many of these non-communicable diseases is obesity, which is detrimental to the health. In the changing times of modernization, lifestyle plays a major role in predetermining the risk of obesity. This study was done to evaluate the impact of obesity among rural adults in Tamil Nadu.

Methods: Cross sectional study was carried out among 600 adults living in rural field practice area of our medical college, using systematic random sampling technique. Using a pre-tested structured questionnaire, data regarding the lifestyle factors was collected. Height, weight, waist circumference and waist hip ratio were measured. Body Mass Index was calculated and classified as per World Health Organization classification for Asian population. Using SPSS Version 17 did the data analysis and the results were presented as tables and graph. **Results:** The prevalence of obesity ($\text{BMI} \geq 25\text{kg/m}^2$) in this study was 25.5% while that of overweight ($\text{BMI} \geq 23\text{kg/m}^2$) was 25.3%. In this study, 48.8% of the participants had high waist circumference and 58.8% of the participants had a high waist hip ratio. Consumption of junk food and lack of physical activity were strongly associated with obesity. **Conclusion:** This study showed that risk factors like increased frequency of consumption of junk food, television viewing and sedentary lifestyle, had a strong and significant association with overweight/obesity. This elucidates the need for providing awareness at the primordial level to promote a healthy lifestyle and prevent risk factors from developing among the population.

Key-words: Body Mass Index, Overweight, Risk factors, Physical Activity

INTRODUCTION

India as a country in economic transition faces several health challenges, of which non-communicable diseases are on the top. Some of these diseases like cardiovascular diseases, cancers and renal failure are the leading causes of death every year. The resulting complications not only increase the morbidity, but also cause substantial disability, placing a severe socioeconomic and psychological burden to the patients and their families. [1] The risk factors of non-communicable diseases are manifold, ranging from obesity, smoking, diabetes mellitus, hypertension, stress, etc. In a broader perspective, non-communicable diseases are also known as lifestyle diseases, implying that lifestyle plays a key role as a potent risk factor. [1, 2]

In India, Industrialization and urbanization brought out many changes in the lifestyle of individuals. [3] In addition, the work culture changed from being an agricultural labor-intensive work to clerical and deskwork, thereby minimizing the need for physical activity. These changes also resulted in increased stress levels, increasing the risk for psychological and psychiatric problems, which have been the causes of

substance abuse and other personal habits like smoking, alcoholism, etc. However, all the above lifestyle changes are responsible for the development of a single strong risk factor, obesity, which is the precursor risk factor for most of the non-communicable diseases.

Obesity is a multi-factorial disorder. Overweight or obesity is the leading cause of hypertension, diabetes, osteoarthritis, and various types of cancers in women like breast cancer and uterus cancer, menstrual disorder and infertility and many more diseases. [2] Obesity is emerging as a serious problem throughout the world not only among adults, but also children, teenagers, and young adults. Of the factors contributing to obesity, stress seems to be particularly important as stress is a precursor for irregularity in diet, lack of exercise and addiction, each being considered independent factors leading to obesity. [3]

The problem of obesity is pertinent in both developing and developed nations alike. When a country achieves economic development, the diet and physical activity patterns of its citizens change greatly. This phenomenon, observed in developing countries, is known as “nutrition

transition". [4] More than 1.1 billion individuals meet current definitions for overweight or obesity which puts them at increased risk for a number of chronic diseases. [5] The prevalence of overweight and obesity have been radically increasing among Indian youth [6] This has been attributed to nutritional transition in India, characterized by a shift in the diet content towards a high fat and high sugar diet. [7] Among developing countries; obesity is now fast growing problem especially in higher socioeconomic status. [8]

It has been estimated that obesity accounts for 2% to 7% of total healthcare costs. [9-11] There are also other costs to consider such as reduced quality of life and productivity loss attributed to medical leave. [4]

There are several studies that have been done in Tamil Nadu to assess the magnitude of obesity. However, there are few studies, which explore the impact of lifestyle problems on the measures of body fat. Establishment of associated factors will be potentially useful in the holistic approach to the prevention of the rising prevalence of obesity and other non-communicable cardiovascular diseases.

With this background, this study was planned with the objectives to estimate the prevalence of various markers of obesity in the study area and to evaluate the impact of lifestyle factors in obesity in the study area.

METHODOLOGY

Study setting and study population: This study was carried out as a community based cross sectional study among rural adults, in the field practice area of our medical college, Rural Health Training Centre (RHTC) located at Sripuram, Kancheepuram district of Tamil Nadu. The duration of the study was for six months, between November 2015 and April 2016. The study population identified was all adults in the age group 20-60 years in the Sripuram area.

Sample size and sampling technique: The Sample Size was calculated based on the prevalence of obesity in an earlier study done in Chennai among the general population, which was found to be 28.5%. [12] Based on this prevalence, using the formula $4PQ/L^2$, with 95% confidence limits and 13.5% relative precision, the sample size was calculated to be 542. Allowing 10% for refusals and attritions, the final sample size was calculated as 596, which were rounded off to 600.

Systematic random sampling method was used to identify the sample population. The list of people in the village aged >20 years was obtained from the field staff of the RHTC. There were a total of 24498 adults in the area living in approximately 7329 households during the study period. The households were arranged in sequential order and sampling frame was prepared. The sampling interval was calculated by dividing the total number of households

(7329) by the required sample size (600). The sampling interval obtained was 12. The first number was selected at random by lottery method as 4. From this number, every 12th household was visited for data collection. All eligible adult residents from each house were taken for the study to get the required sample size of 600. If a house was found locked or eligible subject not available, the next house was visited.

Inclusion and Exclusion criteria: All the adults belonging to age group 20-60 years living in Sripuram area of Kancheepuram district and willing to participate in the study by giving informed consent were included in the study. The residents of Sripuram who were unavailable during the period when study or those who were not willing to give consent for the study and pregnant and lactating women were excluded from the study.

Ethical approval and informed consent: Ethical approval and permission was obtained from the Institutional ethical committee of our medical college prior to the commencement of the study. All participants were explained about the purpose of the study and an informed consent was taken from each of them prior to data collection.

Data collection: The Interns posted to the department collected the data under the supervision of the authors. The interns were thoroughly briefed on the accurate data collection technique and also to do the accurate anthropometric measurements using the standard and regularly validated equipment. Data collection was carried out after pre-testing on 30 adults from a different geographic area to test the feasibility and viability of the interview schedule. The data was collected using a structured pre-tested questionnaire. The questions consisted of demographic characteristics and questions related to their lifestyle. Data was elicited on dietary habits, frequency of junk food consumption and physical activity. Particulars regarding personal habits like smoking and alcohol were also elicited. Physical activity was measured using International Physical Activity Questionnaire (IPAQ).

Metabolic Equivalents (METs) are commonly used to express the intensity of physical activities, and are also used for the analysis of IPAQ data. MET is the ratio of a person's working metabolic rate relative to the resting metabolic rate. One MET is defined as the energy cost of sitting quietly, and is equivalent to a caloric consumption of 1 kcal/kg/hour. For the analysis of IPAQ data, existing guidelines have been adopted: It is estimated that, compared to sitting quietly, a person's caloric consumption is four times as high when being moderately active, and eight times as high when being vigorously active. [13]

In International Physical Activities Questionnaire, the definitions [14, 15] involved are

i. Inactive category:

- a) No activity is reported OR some activity is reported but not enough to meet Categories ii or iii mentioned below.

ii. Minimally Active category

Any one of the following 3 criteria:

- a) 3 or more days of vigorous activity of at least 20 minutes per day OR
- b) 5 or more days of moderate -intensity activity or walking of at least 30 minutes per day OR
- c) 5 or more days of any combination of walking, moderate -intensity or vigorous intensity activities achieving a minimum of at least 600 MET (resting metabolic rate) -min/week.

iii. HEPA active (Health enhancing physical activity; a high active) category

Any one of the following 2 criteria

- a) Vigorous-intensity activity on at least 3 days and accumulating at least 1500 MET-minutes/week OR
- b) 7 or more days of any combination of walking, moderate -intensity or vigorous intensity activities achieving a minimum of at least 3000 MET-minutes/week.

Vigorous physical activities refer to activities that take hard physical effort and make him/her breathe much harder than normal.

Those physical activities that are done for at least 10 minutes at a time only are considered.

Physical examination was carried out to measure height, weight, waist circumference, and hip circumference.

Body weight was measured with the subject standing still on weighing scale and weight equally distributed on each leg. Subjects were instructed to not wear footwear, while their weight was being measured. Height was measured using a non-stretchable tape with the subject in an erect position against a vertical surface.

Waist circumference (WC) was measured midway between the inferior margin of the last rib and the crest of the ileum and hip circumference (HC) around the pelvis at the point of maximum protrusion of the buttocks, both in a horizontal plane, without compressing the soft tissues. WC and HC were recorded to the nearest cm and WHR was defined as a ratio of WC to HC.

Operational Definitions: Body mass index was calculated by dividing the weight (in kilograms) with the square of height (in meters). For Asians population the values of BMI have been reset as their body composition is different from that of the western world. [16, 17] Proposed classification of weight by BMI in adult Asians: Underweight < 18.5; Normal range: 18.5 - 22.9; Overweight >23; Obese I: 25 - 29.9; Obese II > 30. Overweight was defined as a BMI ≥ 23 kg/m² but <25 kg/m² for both genders (based on the World Health Organization Asia Pacific Guidelines) with or without abdominal obesity. [17] Generalized obesity was defined

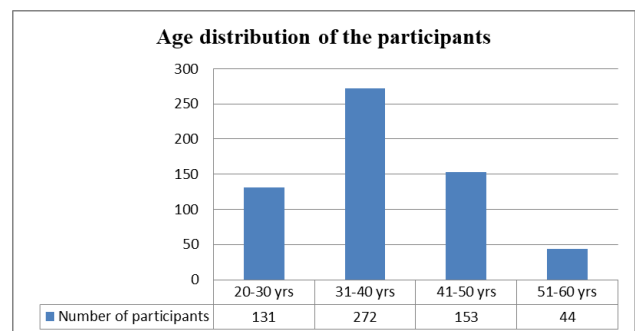
as a BMI ≥ 25 kg/m² for both genders (based on the World Health Organization Asia Pacific Guidelines) with or without abdominal obesity. [17]

Statistical analysis: Data analysis was done using descriptive and analytical statistics. The descriptive statistics like frequency distribution and percentage is used to assess the various variables. The analytical statistics like P-value, Chi- square, Odds ratio and Confidence interval were used to determine the association of obesity with selected variables. Data was analyzed using SPSS version 17. P value < 0.05 was considered as statistically significant value.

RESULTS

This study was carried out among 600 adults residing in the rural field practice area of our medical college. The demographic characteristics of the study participants are given in Figure 1. Among the 600 total study subjects, 317 subjects (52.8%) were males and 283 subjects (47.2 %) were females. The age distribution among the study population ranged between 20-60 years. As shown in the table, majority of the subjects i.e. 67.2% belonged to less than 40 years age group and 32.8% subjects belonged to 40-60 years age group.

Figure-1: Age distribution of the study participants



The prevalence of obesity among the study participants is given in Table 1. The prevalence of obesity (BMI > 25) in this study was 25.5% while that of overweight (BMI >23) was 25.3%. In this study, 48.8% of the participants has high waist circumference and 58.8% of the participants had a high waist hip ratio.

The prevalence of lifestyle risk factors among the study participants is given in Table 2. It was observed that a majority of the participants were non-vegetarian (92.8%) and 87.3% of them consumed non-vegetarian food once a week. Most of the participants (71.3%) watched television for less than 2 hours in a day while 58.5% were found to be minimally active.

Table-1: Prevalence of obesity among the study participants:

Parameters	Frequency	Percentage	95% CI for prevalence
	N =600	(%)	
Body Mass Index			
Underweight	69	11.5	9.0-14.0
Normal	226	37.7	33.8 – 41.6
Overweight	152	25.3	21.8 – 28.8
Obesity	122	20.3	17.1 – 23.5
Very Obese	31	5.2	3.4 – 7.0
Waist circumference			
Normal	307	51.2	47.2 – 55.2
High	293	48.8	44.8 – 52.8
Waist hip ratio			
Normal	247	41.2	37.3 – 45.1
High	353	58.8	54.9 – 62.7

Table -2: Prevalence of lifestyle risk factors among the study participants

Factors	Frequency	Percentage
	N=600	(%)
Dietary habits		
Vegetarian	43	7.2
Mixed	557	92.8
Consumption of non-vegetarian food / week		
Nil	43	7.2
Once	524	87.3
Twice	25	4.2
More	8	1.3
Hours spent watching Television/ computer daily		
< 2 hours	428	71.33
>2 hours	172	28.67
Physical activity		
Inactive	216	36
Minimally active	351	58.5
HEPA	33	5.5

The impact of lifestyle factors on obesity is given in Table 3. In our study, it was observed that junk food consumption was a significant risk factor for obesity ($p=0.0001$). Similarly, lack of activity was also a significant risk factor for obesity ($p=0.0001$) with an odds ratio of 5.6. Watching television for over 2 hours was also an important risk factor for obesity. ($p<0.05$)

DISCUSSION

The present study was conducted in the rural field practice area of the medical college and has made an attempt to determine the impact of lifestyle factors on obesity. In our study population the prevalence of

overweight (BMI > 23) was 25.3%, the prevalence of obesity (BMI > 25) was 25.5%.The prevalence of overweight/ obesity observed in our study was comparable to a study done by Mohan et al - The Chennai urban rural epidemiology study (CURES-52), [12], Prabakaran et al [18] and Venkatachalam J et al. [19]

Table -3: Impact of lifestyle factors on obesity:

Risk Factors	N= 600	Overweight / Obesity N	%	Chi square	P value	O R	95% CI
Dietary habits							
Mixed	557	282	50.6				
Vegetarian	43	23	53.5	0.1	0.718	0.9	0.5-1.6
Junk food consumption							
Present	521	287	55.1				
Absent	79	18	22.8	28.6	0.001*	4.2	2.4-7.2
Hours spent watching television/ computer daily							
>2 hours	172	105	61.1				
< 2 hours	428	200	46.7	10.1	0.002*	1.8	1.2-2.6
Physical activity							
Inactive	216	165	76.4				
Minimally active & HEPA	384	140	36.5	88.2	0.001*	5.6	3.9- 8.2

In our study the association between frequency of consumption of junk food and overweight/obesity is statistically significant. ($p\text{-value}=0.0001$). There is 4 times more chance of becoming overweight/obese on consumption of junk food. Similar association was reported in a study done by Kokila et al among medical college students in Kanchipuram district, Tamil Nadu, it was found that the frequency of eating fatty food is high among obese & overweight individuals when compared to normal and underweight students. [20] A study carried out by Tiwari R et al reported that there was a statistically significant difference noted in the likening of fried food and junk food by obese and overweight persons when compared with persons who have normal body mass index. [21]

Moreover, in our study the association between television viewing and overweight/obesity is statistically significant. ($p\text{-value}= 0.002$). Similar results have been reported in other studies. Goyal *et al.* [22] Bishwalata *et al.*[23] and Laxmaiah *et al.*,[24] also concluded that watching TV or playing computer games for more than 2 h/day significantly increased the risk of being overweight or obese. The association between TV viewing and overweight could be due to snacking and physical inactivity during viewing time.

The association between physical activity and overweight/obesity is statistically significant. ($p\text{-value}= 0.0001$). Similar results have been reported in other studies like the study carried out by Coll JL in the Balearic Islands, a Mediterranean Region it was found that no leisure-time physical activity (LTPA) was one of the main

risk factors associated with overweight/Obesity. [25] Another study carried out by Zhang X et al in a Chinese Rural Population also reported that physical activity was associated with overweight/obesity. [26]

A study carried out by Baalwa J et al in young adults in Uganda, found that physical activity was significantly associated ($P<0.05$) with overweight/obesity.[27] In a similar study carried out by Uthakalla VK et al in Hyderabad, low physical activity was significantly associated with overweight/obesity. [28]

The shift from traditional diets to high-fat and high-energy diets has contributed to the changes seen in people's nutritional status and in the mortality and morbidity patterns in India [29,30] From a large body of evidence, the global epidemic of obesity has resulted mainly from societal factors that promote sedentary lifestyles and the consumption of high-fat, energy-dense diets.[31]

Conclusion: This study showed that risk factors like increased frequency of consumption of junk food, television viewing and sedentary lifestyle, had a strong and significant association with overweight/obesity.

The problem of obesity/overweight is on the rise, and there is a definite need to inculcate good habits of healthy eating and regular physical exercise. Changing dietary habits, using of junk food and limited physical activity pattern due to rapid urbanization, modernization can be reasons for the increase in BMI of Sripuram adults. There is a further need to establish programmes for promoting awareness and lifestyle modifications among the population of the health hazards and means of control for obesity in the study area.

Combating the global epidemic of obesity requires action at the community and national levels. At the national level, framing appropriate policies for promotion of a good diet and adequate physical activity is needed. At the community level, we need to create an environment that promotes the adoption of healthy lifestyle behaviors.

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Conflict of Interest: None

Source of funding support: Nil

How to cite this article: Karthik R C, Gopalakrishnan S. Impact of lifestyle on obesity among rural adults in Kancheepuram District of Tamil Nadu, India. *Nat J Res Community Med* 2018;7(3):196-201.

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NJRCM: www.commedjournal.in



ORIGINAL RESEARCH ARTICLE

DOI: 10.26727/NJRCM.2018.7.3.202-206

Year: 2018 Vol: 7 Issue: 3. Jul.-Sep. Page: 202-206

A STUDY TO ASSESS THE PREVALENCE AND ASSOCIATED RISK FACTORS OF HYPERTENSION AMONG THE WORKERS OF BANGALORE METROPOLITAN TRANSPORT CORPORATION (BMTC) IN BANGALORE CITY

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Date of Submission : 25-03 -2018

Date of online Publication : 07-07-2018

Date of Acceptance : 19-06-2018

Date of Print Publication : 30-06-2018

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ABSTRACT

Introduction: Hypertension has become a significant health problem because of the rapid urbanization and major changes in the lifestyle of the population. Several studies suggest that the percentage increases when selected occupational groups are screened. Transport personnel are one such group who are at risk of developing hypertension due to the nature of their work. Very few studies have been undertaken in this group of population in our country, which prompted us to take up this study. **Methodology:** A cross-sectional descriptive study was done among all the workers of the randomly selected depots of Bangalore Metropolitan Transport Corporation (BMTC) in Bangalore city from October 2014 to June 2016. A pre-tested, semi-structured and self-administered questionnaire was used to collect the data. **Results:** Following the JNC 7 definition of hypertension, the prevalence rate of hypertension was 34.7% in this study. Significant association was found between hypertension and age of the worker; years of work experience; smoking; alcohol and body mass index. **Conclusion:** More than one-third of the workers were found to have hypertension. Thus more emphasis should be made on the need for comprehensive screening programmes for transport workers and awareness campaigns regarding non-communicable diseases and factors affecting them.

Key-words: Hypertension, Transport workers, Risk factors, Prevalence

INTRODUCTION

Non-communicable diseases (NCDs) are the leading causes of death globally, killing more people each year than all other causes combined. Nearly 80% of NCD deaths occur in middle and low income countries. Of the 57 million global deaths in 2008, 36 million, or 63% were due to NCDs, principally cardiovascular diseases, diabetes, cancers and chronic respiratory diseases.¹ Globally cardiovascular disease accounts for approximately 17 million deaths a year, nearly 1/3 of the total. Of these, complications of hypertension account for 9.4 million deaths worldwide every year.²

Hypertension (HTN) is a leading public health challenge globally due to its high prevalence and related morbidity and mortality. More than one in three adults worldwide has high blood pressure.³ HTN exerts a substantial public health burden on cardiovascular health status and healthcare systems in India. Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease (CHD) deaths in India.⁵ Recent studies from India have shown the prevalence of HTN to be 25% in urban and 10% in rural people in India.⁴ The rates for HTN in percentage are projected to go up to 22.9

and 23.6 for Indian men and women, respectively by 2025.⁶

High income countries have begun to reduce hypertension in their populations through strong public health policies such as reduction of salt in processed foods and widely available diagnosis and treatment that tackle hypertension and other risk factors together. India is the largest country in South Asia with huge public transport system characterized by various transport corporations across the country. The transport employees with their busy lifestyles, poor socio-economic condition and high stress at job are subject to the risk of heart diseases especially hypertension. They form a subset of population who are at risk to develop hypertension. Very few studies have been conducted among transport employees in India which prompted us to do this study among the workers of Bangalore Metropolitan Transport Corporation (BMTC).

OBJECTIVES: To estimate the prevalence of hypertension among the workers of Bangalore Metropolitan Transport Corporation (BMTC)

To determine the risk factors associated with hypertension among the workers of BMTC

association between hypertension and designation of the workers in this study. (Table 1)

METHODOLOGY

Out of the 31 depots of Bangalore Metropolitan Transport Corporation (BMTC), 10 depots were chosen by simple random sampling. A cross-sectional descriptive study was done among all the workers of the randomly selected depots of BMTC in Bangalore city from October 2014 to June 2016. Based on a previous study done by Satheesh B.C. et al⁷ the sample size was calculated as 600.

Probability proportional to size (PPS) sampling procedure was used to attain the desired study sample size.. The number of workers to be included in the study from each of these 10 depots was calculated using the formula,

$$N_1 = \frac{\text{Population in each depot}}{\text{Total population}} \times \text{Sample size}$$

Permission from the human resources development (HRD) department of the Bangalore Metropolitan Transport Corporation (BMTC) was sought before taking up this study. The study protocol was approved in the Institutional Ethics Committee of Bangalore Medical College & Research Institute for ethical clearance. A pilot study was done first in one depot, before starting the actual study. Informed consent for the study was obtained from the study participants (Drivers, Conductors & Mechanics) who were not disturbed in their duty hours.

Inclusion criteria for the workers to participate in the study were age above 30 years and a minimum of 5 years work experience at BMTC. A pre-tested, semi-structured and self-administered questionnaire was used to collect the data. The questionnaire was divided in three parts. **Part I** included the information on socio demographic variables; **Part II** had information on risk factors and **Part III** included the information on physical examination and blood pressure recording of the study subjects. A standard calibrated mercury sphygmomanometer, a standard measuring tape, a standard weighing scale calibrated to zero were used for data collection.

Data was entered in an MS Excel sheet and analyzed by SPSS version 23. Descriptive statistical analysis, which included frequency, mean, standard deviation and percentages, was used to characterize the data.

RESULTS

Out of the total 600 workers who participated in the study, 538 were males and only 62 were females. Following the JNC 7 definition of hypertension, the prevalence rate of hypertension was 34.7% in this study. More than two-third of the study participants were in the age group of 30 to 39 years and those workers aged 40 to 44 years constituted the least. Significant association was found between age of the workers and hypertension. (Table 1) Nearly equal participation of all types of workers such as drivers cum conductors (26%), drivers (27%), conductors (25%) and mechanics (22%) was seen. There was no significant

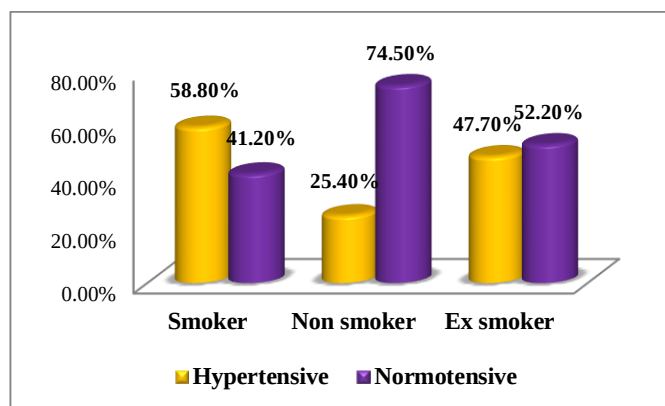
Table 1: Distribution of study population according to blood pressure and its related factors

Parameter	Hypertensive No (%)	Normotensive No (%)	Significance
Age of the worker			
30 - 34 years	44 (18.6%)	192 (81.4%)	$\chi^2 = 51.176$ p = < 0.05
35 - 39 years	72 (41.9%)	100 (58.1%)	
40 - 44 years	51 (56.6%)	39 (43.3%)	
≥ 45 years	41 (40.1%)	61 (59.8%)	
Designation			
Driver cum Conductor	60 (38.5%)	96 (61.5%)	$\chi^2 = 4.504$ p = > 0.05
Driver	56 (35%)	104 (65%)	
Conductor	56 (36.8%)	96 (63.2%)	
Mechanic	36 (27.3%)	96 (72.7%)	
Years of Service			
5 - 9 years	84 (26.3%)	236 (73.8%)	$\chi^2 = 29.768$ p = < 0.05
10 - 14 years	64 (43.2%)	84 (56.8%)	
15 - 19 years	16 (30.8%)	36 (69.2%)	
≥ 20 years	44 (55%)	36 (45%)	
Education			
Primary/Middle school	--	--	$\chi^2 = 0.114$ p = > 0.05
High school	68 (34.7%)	128 (65.3%)	
Intermediate school	77 (38.3%)	124 (61.6%)	
Diploma	27 (28.4%)	68 (71.5%)	
Graduate	36 (33.3%)	72 (66.7%)	
Socio-economic status			
Upper	3 (42.8%)	4 (57.1%)	$\chi^2 = 26.116$ p = > 0.05
Upper Middle	172 (40.8%)	249 (59.1%)	
Lower Middle	19 (13.2%)	124 (86.1%)	
Upper Lower	11 (55%)	9 (45%)	
Lower	3 (33.3%)	6 (66.6%)	
Smoking Habit			
Smoker	80 (58.8%)	56 (41.2%)	$\chi^2 = 45.311$ p = < 0.05
Non-Smoker	107 (25.4%)	313 (74.5%)	
Ex-Smoker	21 (47.7%)	23 (52.2%)	
Duration of Smoking			
≤ 5 years	4 (20%)	16 (80%)	$\chi^2 = 79.149$ p = < 0.05
6 - 10 years	40 (55.5%)	32 (42.1%)	
11 - 15 years	12 (75%)	4 (25%)	
16 - 20 years	8 (66.7%)	4 (25%)	
≥ 20 years	16 (100%)	--	

Table 2: Distribution of study population according to factors affecting blood pressure

Parameter	Hypertensive No (%)	Normotensive No (%)	Significance
Alcohol Consumption			$\chi^2 = 55.236$ p = < 0.05
Non-user	82 (22.5%)	282 (77.4%)	
Moderate user	98 (52.4%)	89 (47.5%)	
Heavy user	28 (59.1%)	21 (42.8%)	
Duration of Drinking			$\chi^2 = 48.014$ p = < 0.05
≤ 5 years	48 (48%)	52 (52%)	
6 - 10 years	38 (52.7%)	32 (44.4%)	
11 - 15 years	20 (62.5%)	14 (43.7%)	
16 - 20 years	16 (66.7%)	8 (33.3%)	
≥ 20 years	4 (50%)	4 (50%)	
Physical Activity			$\chi^2 = 2.114$ p = > 0.05
Present	44 (29.7%)	104 (70.3%)	
Absent	164 (36.3%)	288 (63.7%)	
Type of Diet			$\chi^2 = 2.471$ p = > 0.05
Vegetarian	21 (32.3%)	44 (64.7%)	
Mixed	187 (34.9%)	348 (65.4%)	
Salt rich food consumption			$\chi^2 = 3.306$ p = > 0.05
Consumed	80 (37.7%)	132 (62.3%)	
Not consumed	128 (32.9%)	260 (67%)	
BMI			$\chi^2 = 50.142$ p = < 0.05
Under weight	5 (31.3%)	11 (68.8%)	
Normal	110 (34%)	214 (66%)	
Over weight	79 (33.5%)	157 (66.5%)	
Obese	14 (58.3%)	10 (41.7%)	

Figure 1: Distribution of the study population according to Blood Pressure & Tobacco Smoking



In this study, the highest prevalence of hypertension was seen in those who had more than 20 years of service (55%) followed by those with 10 to 14 years of service (43.2%). A significant association between hypertension and years of service was found in this study ($p < 0.05$). The workers employed more than 20 years have 3.4 times more risk of

developing hypertension than those employed for 5 to 9 years. In this study, there was no significant association between prevalence of hypertension and the level of education and the socio-economic status of the workers. (Table 1)

Among all, 70% of the study participants were non smokers and 22.7% were current smokers. 7.3% of them claimed that they had quit smoking. There was significant association between tobacco use and hypertension in this study ($p < 0.05$). The odds for hypertension among current smokers were 4 times more than those for non-smokers. (Figure 1) About 60% of the study participants did not use alcohol ever while 31.2% were moderate users and 8.1% of them were heavy users of alcohol. Alcohol intake had a significant association with hypertension in this study ($p < 0.05$). The odds of hypertension among those who were heavy users was 4.5 times more than those who were non-users. (Table 2)

Though the prevalence of hypertension was more (36.3%) among those who did no physical exercise at their leisure time than those who did some form of physical exercise (29.7%), there was no significant association ($p > 0.05$). The prevalence of hypertension was more among those who consumed salt rich food (37.7%) than those who did not consume (32.9%). Still, there was no significant association ($p > 0.05$) between hypertension and salt rich food intake in this study. (Table 2) In the present study 58.3% obese study participants had hypertension when compared to 34% of those who had normal BMI. As the BMI of the study participants increased, the prevalence of hypertension too increased in this study. The odds of hypertension among the obese was 2.7 times more than those with normal BMI. (Table 2)

DISCUSSION

The prevalence rate of HTN in our study was found to be 34.7%. The reason for such high prevalence could be attributed to the increased substance abuse seen among the workers, with 23% of them smokers and 40% consuming alcohol. Also 3/4th of study participants lacked adequate physical exercise and 65% of them were found to consume salt rich food on a daily basis.

The prevalence of HTN was comparable to a similar study done by Madhumita et al in North Karnataka wherein the overall prevalence rate of hypertension was 37.6%.⁸ A similar study conducted by Arjun Lakshman et al in North Kerala showed the prevalence rate of hypertension to be 41.3% among bus drivers.⁹ Similar to our study, Mohan V et al showed that 80% of the hypertensives were aged 50 years or more in their Chennai Urban Rural Epidemiological Study (CURES)¹⁰ and Chandwani et al in Gujarat found significant correlation of blood pressure with increasing age groups.¹¹

In the present study significant association was found between tobacco smoking and hypertension. Das SK et al

have found in their study done among adults in West Bengal, that the prevalence was higher among tobacco smokers (85.4%) than those who do not smoke (53.3%).⁴ A study done by Madhumita et al in 2012 in North Karnataka had concluded that 51.5% of smokers had hypertension as opposed to 27.6% among non-smokers.⁸ Alcohol intake had a significant association with hypertension in this study, which is similar to a study done by Chandwani H et al in Gujarat.¹¹

There was no significant association between physical activity and hypertension in this study, whereas, Midha T et al¹² and Sharma AK et al¹³ concluded in their study that physically inactive persons were at a higher risk of developing hypertension as compared to persons who had regular physical activity. Unlike our study, Bhadoria et al have found in their study done in Central India that 37.6% of those who have excess salt intake had hypertension as opposed to 21.4% of those who consume less salt.¹⁴ In the present study a significant association was found between hypertension and BMI which is similar to many epidemiology studies on hypertension. In a study done by Gupta R et al, it was found that prevalence of hypertension increased significantly with increasing body mass index.¹⁵

CONCLUSION: Transport personnel are at higher risk of developing HTN due to the nature of their profession. The related impacts are not only harmful to their health but also may endanger the safety of the people using these public transport systems. As quite a proportion of the study participants are suffering from hypertension, it is imperative to focus on high risk screening for early diagnosis and prompt treatment to avoid grave complications of hypertension. This could be made mandatory to all the workers, especially those aged more than 40 years.

RECOMMENDATIONS: An education programme has to be conducted to raise the awareness among the workers regarding risk factors, complications of hypertension, its prevention and control, focusing more on modifiable risk factors. The finding that a large proportion of workers were smoking tobacco and consuming alcohol and its significant association with hypertension is a cause of serious concern. Medical and administrative authorities must educate the people about the risks associated with such habits and motivate them to avoid such habits.

Legislation should be passed by the government of India for banning tobacco products and alcohol as these are highly prevalent risk factors of hypertension. Obesity and extra salt intake are important risk factors for developing hypertension; hence the government should make it mandatory for all processed food products to display the amount of calories, cholesterol and salt present in them.

LIMITATIONS:

Few of the variables analyzed in the present study were based on the information given by the study participants.

Hence an element of unavoidable recall bias could be present in the study. In the present study, only selected risk factors of hypertension have been studied and all risk factors could not be studied because of lack of resources.

The blood pressure of the study participants were measured over a single period of time. So we cannot say whether the person had persistent hypertension. Secondary causes of hypertension could not be ruled out, which usually requires extensive radiological and biochemical investigations.

ACKNOWLEDGEMENT: We would like to thank all the BMTC workers who participated in the study & BMTC administration. We would also like to thank Dr. Ranganath T S for his valuable inputs.

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Conflict of Interest: None

Source of funding support: Nil

How to cite this article: Shibi , Nimra Shireen , Ranganath T S . A study to assess the prevalence and associated risk factors of hypertension among the workers of bangalore metropolitan transport corporation (BMTC) in Bangalore city. Nat J Res Community Med 2018;7(3):66-69.

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ORIGINAL RESEARCH ARTICLE

DOI: 10.26727/NJRCM.2018.7.3.207-211

Year: 2018 Vol: 7 Issue: 3. Jul.-Sep. Page: 207-211

Are antimalarial activities performed properly by frontline health workers? A cross-sectional study in Bankura

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Date of Submission : 25-03-2018

Date of online Publication : 07-07-2018

Date of Acceptance : 19-06-2018

Date of Print Publication : 30-06-2018

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ABSTRACT

Background: Under NVBDCP, health workers at subcentre level are primarily responsible for diagnosis of malaria through blood smear or RDT and managing accordingly. **Objective:** To assess the knowledge regarding diagnosis, treatment and control of malaria as per national programme and the skill on diagnosis and management of malaria in addition to logistic support and performance on diagnosis, management & reporting of malaria in last 12 months. **Materials and Methods:** A descriptive cross-sectional study was conducted in Bankura district of West Bengal. Two blocks were selected through stratified random sampling based on Annual Parasite Incidence (API). In each block, 3 Gram Panchayats (GP) were selected through stratified random sampling based on distance from Block Headquarters. All Health workers working at all sub-centres within selected GPs were included in the study. Mean score of knowledge and skill was computed. Data were analysed using SPSS version 22.0. **Results:** 68.7% of them were untrained in Malaria in Gangajalghati block. More than 70% of health workers knew the correct interpretation of Rapid diagnostic test in both blocks. Correct knowledge on complete treatment of *P. vivax* was better than of *P. falciparum* in all groups of health workers. Knowledge on contraindication of antimalarial drugs was not good among them. Skill on preparing blood smear, performing RDK and case management was average with wide variation among several types of health workers. **Conclusion:** Knowledge on malaria diagnosis and control among health workers were average while on treatment was less than average with wide variations among several types of health workers. Higher educational qualification, lesser service experience and training in malaria revealed better knowledge among health workers.

Key-words: Malaria, rapid diagnostic test, Annual Parasite Incidence (API), skill, blood smear.

INTRODUCTION

Malaria caused by *Plasmodium* species continues to be a major public health problem in India with high mortality in complicated malaria in *Plasmodium falciparum* (Pf) infestation.¹ About 27% population of the country lives in areas with high malaria transmission with Annual Parasite Incidence (API) 1 or more whereas another 58% lives in areas with low malaria transmission (API < 1).¹ 15 states of India including north eastern states and West Bengal reported around 92% of all malaria cases and 97% of deaths due to malaria.² In 2012, the Annual Blood slide Examination Rate (ABER), API, Slide positivity rate (SPR) and Pf proportion (Pf%) were 9.0%, 0.88%, 0.98% and 50% respectively. The corresponding figures for West Bengal were 5.4%, 0.6%, 1.1% and 15.5% respectively.³ The corresponding figures for Bankura district were 10.18%, 0.45%, 0.44% and 22.95% respectively.⁴ The forest and forest fringe areas of Terai, Dooars in northern districts and Junglemahal areas of south western districts along with Kolkata and adjoining areas are known for high transmission of malaria.⁵

It is estimated that practical and accurate diagnostic tests for malaria diagnosis have the potential to avert 400 million unnecessary treatments and save 100,000 lives annually.⁶ Resistance of *Plasmodium falciparum* to Chloroquin has been widespread in India and in response; Artemisinin-based Combination Therapy (ACT) is recommended as the first line treatment for all cases in India.⁷

Under national Vector Borne Disease Control Programme (NVBDCP), one of the major thrust areas for malaria control is early diagnosis and prompt, complete, effective treatment. For strengthening diagnostic activities, Rapid Diagnostic test (RDT) with bivalent (both Pf and Pv) or monovalent (Pf only) kit has been introduced in high endemic areas.⁸⁻⁹

Under NVBDCP, health workers at sub-centre level are primarily responsible for diagnosis of malaria through blood smear or RDT and managing accordingly.^{8, 10} It was noted worldwide that in providing good quality care

for malaria, the stumbling blocks are increasing complexities in diagnosis and treatment of malaria as well as lack of appropriate skills in peripheral health workers.¹¹⁻¹³ However, there is paucity of data regarding knowledge, skills and practices of frontline health personnel in India in published literature¹⁴. On the basis of this background the study was conducted in Bankura district of West Bengal (India) at Sub-centre level to assess the knowledge of frontline health workers regarding diagnosis, treatment and control of malaria as per national programme (NVBDCP), to assess the skill of study participants on diagnosis and management of malaria and to assess the logistic support and performance of health workers regarding antimalarial activities in last 12 months.

MATERIAL AND METHODS

An observational, cross-sectional, descriptive study was undertaken among frontline health workers at subcentre level in Bankura district. Bankura, a south-western district in West Bengal with 3.5 million population covering 6882 sq. Km. Area over 22 community development blocks.¹⁵ Primary health care in the district is provided through 22 Block level Primary health centre/ Rural hospitals, 70 Primary Health centres and 564 subcentres. Nine blocks of the district are malaria endemic with a long standing focus of Chloroquin resistance.^{16, 17} Total duration of the study was of 8 months from May to December 2014. Based on the state average of Annual Parasite Incidence (API), 2 blocks in Bankura districts of West Bengal was selected: one with $API \geq 1$ and another with $API < 1$. Ranibandh block with $API = 4.52$ and Gangajalghati block with $API = 0.05$. In each of the selected block, GPs was divided into 3 strata based on distance from block head quarter using tertile values. From each stratum 1 GP was selected by simple random sampling. All the sub-centres under those 3 GPs were covered in this study. Total 35 health workers were included in this study. Health workers working under selected sub-centres were taken as study subject. Semi-structured questionnaire was used to collect baseline information and knowledge on diagnosis, treatment and control of malaria as per national programme of the health care providers. Clinical case vignettes were used as simulation for assessing the skill of the providers in malaria case management. A checklist was used for observation during preparation of blood smear and performing RDT. Review of records was done for assessing their performance regarding diagnosis, management and reporting of malaria cases in last 12 months.

Data management and analysis:

After getting ethical permission from Institutional Ethical committee of Bankura Sammilani Medical College, Bankura, West Bengal. Data collection tools was developed and tested among health workers in a nearby block. Data were collected by the investigator through visit to the selected sub-centres of both the blocks. Mean

($\pm$ SD) of score and proportion of specific attributes in the domain of knowledge, skills and practices was calculated and expressed in suitable tables and diagrams. Parametric and Bivariate non-parametric test was applied to assess the relation of socio-demographic, individual and health service related variables of HWs and their knowledge, skills and practice. For scoring of skills for preparation of blood slides, performance of RDK and case management and knowledge score of the health workers raw data were used.

RESULTS

In both the block 35 health workers were taken as study sample among which fifteen were 1st ANM, fifteen were 2nd ANM and five of them were HW(M). Proportion of health workers was 60.0% of 1st ANM, 40.0% of 2nd ANM and 20.0% of HW(M) in Gangajalghati block whereas in Ranibandh block it was 40.0%, 60.0% and 80.0% respectively.

Majority of health workers' qualification was higher secondary (56.3%) at the time of joining the service in Gangajalghati whereas higher secondary (42.1%) and graduate (42.1%) in Ranibandh block. 37.5% of health workers in Gangajalghati and 47.4% in Ranibandh block had service experience of 2-5 years. Almost one-third of health workers had 10 years or more service experience in Gangajalghati while no participants had experience beyond 10 years in Ranibandh block. Only one-third of health workers were trained in Malaria in Gangajalghati (31.3%) whereas all of the health workers in Ranibandh were trained in Malaria.

Table No.1: Distribution of health workers according to designation and the knowledge on diagnosis, treatment and contraindication of drug of malaria (n=35)

Knowledge on	1 st ANM	2 nd ANM	HW(M)	χ^2	p value
	No. (%)	No. (%)	No. (%)	Linear trend	
Volume of blood required for both thick and thin smear	5(33.3)	8(53.3)	4(80.0)	2.24	0.37
Interpretation of RDK	14(93.3)	8(53.3)	4(80.0)	1.96	0.16
Correct treatment of Plasmodium vivax	8(53.3)	7(46.6)	3(60.0)	0.005	0.94
Correct treatment of Plasmodium falciparum	3(20.0)	1(6.6)	2(40.0)	0.204	0.65
Contraindication of Chloroquine	5(33.3)	2(13.3)	2(40.0)	0.054	0.81
Contraindications of ACT	9(60.0)	5(33.3)	3(60.0)	0.296	0.58
Contraindications of Primaquine	5(33.3)	3(20.0)	1(20.0)	0.605	0.43

Majority of HW(M) (80.0%) had knowledge on correct amount of blood for both thick and thin smear. Correct knowledge on interpretation of RDK was highest among 1st ANM (93.3%) followed by HW(M) (80%) then 2nd ANM(53.3%). Correct knowledge on treatment of Plasmodium vivax was better than Plasmodium falciparum in all the groups of health workers. Correct knowledge on contraindication of Chloroquine, ACT and Primaquine drugs was not good among the health workers. The differences were not statistically significant on knowledge on diagnosis, treatment and contraindications of treatment among health workers ($p>0.05$). Nearly half of health workers were aware of all the three indications for referral of complicated malaria cases and the difference was statistically not significant ($p>0.05$). 6.7% of 2nd ANM could not spell out any of the preventive measure.(Table 1)

Table no 2: Knowledge of workers on few aspects of malaria (n=35)

Knowledge on	1 st ANM No. (%)	2 nd ANM No. (%)	HW(M) No. (%)	Total No. (%)
Indications for referral	7(46.7)	7(46.7)	2(40.0)	16(45.7)
Preventive measures	15(100.0)	13(86.6)	5(100.0)	33(94.3)
Duration of effectiveness of one round DDT spray	7(46.7)	9(60.0)	3(60.0)	19(54.3)
Duration of effectiveness of LLIN	5(33.3)	3(20.0)	3(60.0)	11(31.4)
Population catered under their Sub-centre	14(93.3)	15(100.0)	5(100.0)	34(97.1)
Target blood slide/annum	6(40.0)	9(60.0)	4(80.0)	19(54.3)
Name of reporting forms	14(93.3)	13(86.7)	5(100.0)	32(91.4)
Time for submission	12(80.0)	8(53.3)	3(60.0)	23(65.7)
Place for submission	14(93.3)	11(73.3)	4(80.0)	29(82.9)

Correct knowledge regarding duration of effectiveness of one round of DDT spraying among health workers was 54.3% and for LLIN 31.4% irrespective of their designation. The difference in DDT spray and also in LLIN was statistically not significant ($p>0.05$). 97.1% of health workers were aware of the population catered under their respective sub-centre (SC). 54.3% of the participants knew their target for annual blood slide collection under their catering population. 91.4% of health workers were aware of the correct forms for submission of monthly report of malaria. Majority of 1st ANM (80.0%) knew when it is to be submitted. 82.9% of health workers knew the place of submission for reporting form. The difference on knowledge of reporting formats and procedures was not statistically significant ($p>0.05$).(Table 2)

Figure 1: Box and whisker plot showing distribution of knowledge score of health workers, skill of preparing Blood Smear, skill on performance of Rapid Diagnostic Test among health workers according to the designation, malaria training status and educational status of health workers

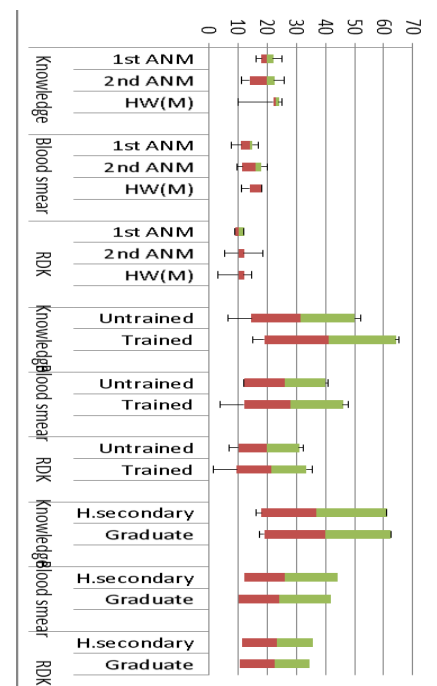
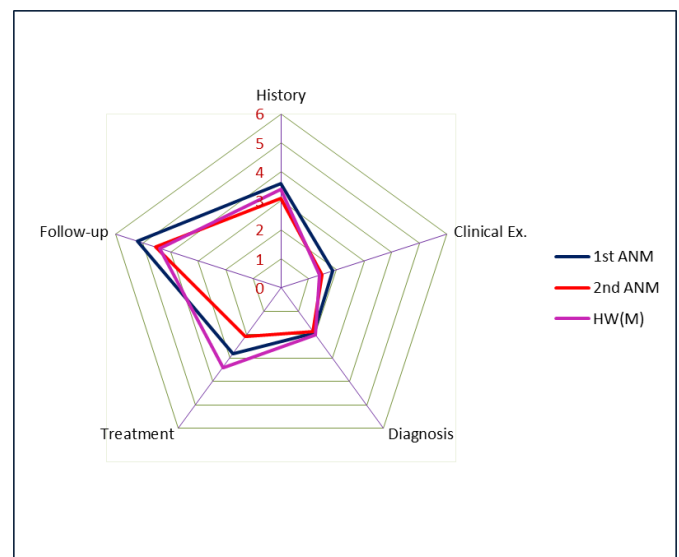


Figure No. 2: Radar chart showing skill of case management among different health workers.

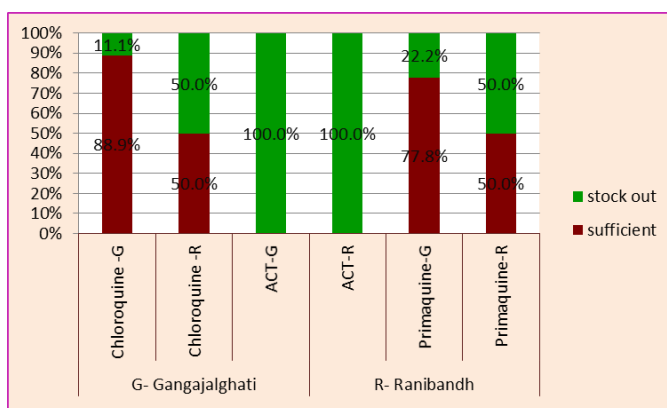


Median knowledge score of health workers with duration of service less than 5 years (21.5) was more than that of health workers with service duration of equal to or more than 5 years (18) regarding diagnosis, treatment and control of malaria as per national programme. Wide variation was seen in health workers with more than 5 years of duration of service above median and below median in less than 5 years of duration of service.

Median knowledge score of 1st ANM and 2nd ANM were equal (20) whereas HW (M) had better score (23) on knowledge regarding diagnosis, treatment and control of malarias per national programme. Wide variation below median was seen among 2nd ANM in knowledge score.

Median knowledge score of trained (22) health workers was better than untrained (17) and no variation was seen on health workers training status. Median skill score for preparation of blood smear was much better in HW(M) (18) followed by 2nd ANM (16) then 1st ANM (14). Wide variation above and below median score was seen in 2nd ANM. Wide variation was seen below median in 1st ANM and HW(M). Median skill score for preparation of blood smear was better among health workers trained (16) in malaria than untrained workers (14). Wide variation was seen more, below median in trained health workers. Median skill score of health workers in performance of Rapid Diagnostic Test was equal in 2nd ANM and HW(M) (12) whereas less in 1st ANM (10). The skill score of 2nd ANM and HW(M) varied more below median while varied more in above median among 1st ANMs. Median skill score in performance of Rapid Diagnostic Kit was more in trained (12) than untrained (10) health workers. The skill score was varied above median among untrained health workers and below median among trained health workers. Median knowledge score among graduate and above (20.5) was higher than below graduate (19) health workers regarding diagnosis, treatment and control of malarias per national programme. Wide variation was seen above median among the below graduates.

Figure No.3: Bar diagram showing Block wise distribution of Antimalarial drugs (n=19)



for history taking, clinical examination and follow up were better in 1st ANM than other worker. Skill of all health workers was similar in case of diagnosis. Skill of HW(M) was better in treatment of malaria followed by 1st ANM then 2nd ANM. Skill of 2nd ANM was less than 1st ANM and HW(M) in history taking, diagnosis and treatment of malaria.

Stock out of chloroquine was 11.1% in sub-centres of Gangajalghati and 50.0% in sub-centres of Ranibandh block and of primaquine was 22.2% and 50.0% in sub-centres of respective blocks. Stock out was 100.0% in both the block for ACT drug. 33.3% of stock out of blood slide and 22.2% of lancet was seen in some Sub-centres of Gangajalghati whereas 20.0% of RDK stock out was present in some Sub-centres of Ranibandh. Insufficient supply of blood slide, lancet and RDK was present in some Sub-centres of both the blocks.

Supply of M1 and M4 forms was sufficient in 100.0% subcentres of both the block. Stock-out of M2 forms was similar in subcentres of both the blocks (11.1% & 10.0%) and of M1 forms was 10.0% in subcentres of Ranibandh block. Number of fever cases treated was more in Gangajalghati than that of Ranibandh block. Performance of Rapid diagnostic test, blood slides drawn and frequency of sending blood slides for examination of diagnosis of malaria per month were better in Ranibandh than Gangajalghati block. The difference was statistically not significant ($p > 0.05$).

DISCUSSION

Knowledge on interpretation of RDK was nearly 75.0%. Hawkes et. al in their study showed that 100% of

participants correctly interpreted the RDT result. Correct knowledge on complete treatment of Pv and Pf was found in 51.43% & 17.14%, respectively. Correct knowledge on contraindication of Chloroquine, ACT and Primaquine was revealed in 31.6%, 57.9% and 26.3% of workers respectively. Reethaet. al reported in her study 12.1-30.9% respondents had knowledge about blister pack

Chloroquine + primaquine. In a multi-centric study knowledge of healthcare providers regarding the correct effectiveness of LLIN was more than the present

study. In another study in Pakistan, higher levels of education have been associated with improved knowledge about the appropriate strategies for the prevention and

treatment of malaria. Mbachu et. al reported in Nigeria that over 80% of health workers was able to correctly identify the malaria M & E forms which corroborates

with the present study. In a similar study conducted in Pakistan revealed education intervention was successful in increasing knowledge and changing

behaviour. Knowledge, perception and practice gap was found among lower cadres of health workers with perception and practice being higher than knowledge in

Nigeria. In a study in Congo, median (range) scores for RDT skills assessment were 100% (94% to 100%)

whereas it was less in present study. Higher education and training in malaria revealed better knowledge among health workers with lesser work experience. But knowledge of malaria M & E (monitoring and evaluation) was found to significantly increase with increasing age and this was attributed to the positive effect of work

experience on knowledge. Schmidt et al in their study showed that job experience had a substantial direct impact on job knowledge and a smaller impact on performance

capabilities.

Conclusion:

More than two-thirds of health workers were not trained in malaria in Gangajalghati block. Higher studies and training in malaria revealed better knowledge among

health workers with lesser work experience. Knowledge on malaria diagnosis and control of malaria among health workers of study area as per national programme was average with wide variation among several types of health workers. Knowledge on malaria treatment as per national programme among health workers of study area were less than average with wide variations among several types of health workers. Logistic support was not sufficient with irregular supply, especially of ACT drug in all sub-centre of both the study areas. Skill on preparation of blood smear, performance of RDK and case management were average with wide variations among several types of health workers.

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Conflict of Interest: None

Source of funding support: Nil

How to cite this article: Indu Padmey, Arindam De, DiptoKanti, Aditya Prasad Sarkar , Asit Baran Saren, Gautam Narayan Sarkar . Are antimalarial activities performed properly by frontline health workers? A cross-sectional study in Bankura. *Nat J Res Community Med* 2018;7(3):66-69.

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NJRCM: www.commedjournal.in



ORIGINAL RESEARCH ARTICLE

DOI: 10.26727/NJRCM.2018.7.3.212-215

Year: 2018 Vol: 7 Issue: 3. Jul.-Sep. Page: 212-215

Is the awareness regarding post exposure prophylaxis of blood borne infections among nurses in a tertiary health care setting still poor?:Necessity and Challenge.

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Date of Submission : 30-05-2018

Date of online Publication : 15-07-2018

Date of Acceptance : 19-06-2018

Date of Print Publication : 31-07-2018

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ABSTRACT

Background- Among health care workers needle stick injury is a common source of transmission of infections. Being in health sector and providing care to patients, imposes a risk to health of care workers itself. **Aims & Objectives:** To assess awareness regarding post exposure prophylaxis against blood borne infections among healthcare workers. **Material & Methods:** Descriptive cross-sectional study was designed to assess about awareness level among nurses who are directly dealing with patient care in tertiary care hospital of Pune. Simple questionnaire was given to them for their assessment of awareness level. **Results:** 84% nurses were aware about blood borne infections, around 75% of these nurses knew about the pre-exposure vaccinations against these diseases. Regarding attitude, majority of nurses felt that there should be a healthcare policy for preventing blood borne infections at their workplace. Needle stick injuries among nurses seemed to be low as 73% of them said that they wear gloves while handling sharp instruments. **Conclusion:** It is quite evident from this study that there is fair knowledge among nurses about blood borne infections and their transmission by sharp instruments but had poor awareness about the post exposure prophylaxis

Key-words: Blood borne, Infections, nurses, tertiary hospital

INTRODUCTION

Occupational needle stick injuries are the most prevalent in the healthcare sector which has intensified the need to act.⁽¹⁾Transmission of at least twenty different pathogens by needle stick and sharps injuries has been reported out of which HIV, Hepatitis B, and Hepatitis C are the primary reasons for concern.⁽²⁾ These do not spread through droplet infection or through intact skin but by direct inoculation of viruses into cutaneous scratches, skin lesions, abrasions, and inoculation of viruses on the mucosal surfaces of the eyes, nose or mouth through accidental splashes. Even though these infections can be prevented by adopting general and specific measures of prevention and control, they still bear immense importance for healthcare services in a developing country.⁽³⁾Occupational exposure to pathogens that cause these infections is linked to the fear and prejudice prevailing in the healthcare workers. Unsafe practices such as careless handling of contaminated needles, unnecessary injections on demand, re-use of inadequately sterilized needles and improper disposal of hazardous wastes have potentially increased the risk of professional exposure to blood borne pathogens.⁽⁴⁾ The first case of a healthcare worker developing HIV infection after a needle stick injury was reported in 1984⁽⁵⁾. Ever since, the estimated risk for HIV transmission following injury by a needle contaminated with HIV infected blood is 0.3%.^(6,7) World Health Report 2002, states that 2.5% of HIV cases among health care workers worldwide are the result of occupational exposure. Many researchers have stated that

40-70% of all needle stick injuries are unreported.⁽⁸⁾Without documentation of the injury, the affected staff is unlikely to get workers compensation benefits if later becoming infected with any of the blood borne pathogens.

AIM: To assess awareness regarding post exposure prophylaxis against blood borne infections among healthcare workers.

OBJECTIVES: To assess knowledge, attitude and practice of healthcare workers in a tertiary care hospital regarding post exposure prophylaxis of blood borne diseases.

Methods

A descriptive cross-sectional study was carried out among Nurses(GNM and ANM) of . Dr. D. Y. Patil Medical College & Hospital and Research Centre Pimpri, Pune. The study was carried out for a duration of two months .The came out to be 81, considering the knowledge of post exposure prophylaxis of blood borne infections to be 70.4%.⁽⁹⁾ and margin of error to be 10% using WinPepi statistical software. Further, considering 10% dropout, the sample size was 90. According to convenience sampling, nurses were selected from all the wards of the hospital. A pre-designed semi structured questionnaire was given to the study group. A pilot study was done on 10% of study sample prior to the study to make the required changes in the questionnaire. A written

informed consent was obtained from all the participants. After analyzing the study, required health education was given to the healthcare workers in their best interest. The data was entered in Excel and results were represented in percentages.

Results

Study group consisted of 6% male nurses and 94% female nurses. Nurses were mainly in the age group of 20-30 and there was a notable female preponderance as well. (Table 1).53% nurses have a degree in GNM and 28% in ANM. 84% nurses were aware about blood borne infections and could correctly answer how they can be transmitted in a healthcare setting. Around 75% of these nurses knew about the pre- exposure vaccinations against these diseases. (Table 2).Majority 79% of nurses said that washing immediately with soap and water should be the very first step after a needle prick and 15% nurses said that the wound should be bandaged. Whereas 4% of them claimed that it was sensible to do nothing about it and visit a doctor instead. Needle stick injuries among nurses seemed to be low as 73% of them said that they wear gloves while handling sharp instruments. Only about 9% nurses claimed that they re-used unsterilized needles. 14% of nurses have had a needle stick injury at their workplace and a majority of them claimed to have washed it immediately with soap and water. However only 30% of the injured nurses took respective post exposure prophylaxis after the injury. (Table 4)

Table 1- Distribution of study group according to age and sex

Age	Male	Female	Total	%
20-30	5	75	80	88.89
30-40	0	4	4	4.44
> 40	0	6	6	6.67
Total	5	85	90	100.00

Tables2- Knowledge among nurses regarding blood borne infections.

Variables	n (%)
No. of nurses aware about blood borne infections	76(84)
No. of nurses aware about pre exposure vaccinations for the Infections.	68(75)
What should be done in case of a needle prick?	
Wash immediately with soap and water.	71(79)
Put finger in mouth.	00(00)
Bandaging	15(17)
Nothing to be done.	04(04)

Discussion

Majority 84% of nurses had the knowledge about blood borne infections and their transmission. These nurses also knew that the most common blood borne infections are HIV, hepatitis B, hepatitis C which are lethal. In a study in south India⁽¹⁰⁾, 92% health care worker had fair general awareness about Blood Borne infections. 89.23% of the students had correct knowledge about Needle Stick Injury and 91.55% of the students had adequate level of

awareness regarding its management in a systematic review study among dental professionals and students⁽¹¹⁾. In a study in Delhi⁽¹²⁾, 64.5% nurses in tertiary care hospital had inadequate knowledge about transmission of blood borne infections.

Table-3-Attitude of Nursing Staff towards blood borne infections

Variables	n(%)
1 Do you think there should be a training programs for preventing blood borne infections among healthcare workers at your workplace?	
a. Strongly agree	46(51)
b. Agree	37(41)
c. Not sure	05(06)
d. Disagree	00(00)
e. Strongly disagree	02(02)
2 Do you think universal precautions should be followed by the healthcare workers while handling infectious patients?	
a. Strongly agree	63(70)
b. Agree	19(21)
c. Not sure	02(02)
d. Disagree	05(06)
e. Strongly disagree	01(01)
3 Do you think needles should be re-capped??	
a. Strongly agree	11(12)
b. Agree	04(04)
c. Not sure	10(11)
d. Disagree	02(02)
e. Strongly disagree	63(70)
4 Do you think there should be a protocol for post exposure prophylaxis in a hospital in case of an emergency?	
a. Strongly agree	70(78)
b. Agree	15(17)
c. Not sure	02(02)
d. Disagree	02(02)
e. Strongly disagree	01(01)

4.Practice on handling blood borne infections

Variables	n(%)
1 Nurses who wear gloves while handling sharp instruments	66(73)
2 Nurses who re-use unsterilized needles	08(09)
3 Nurses who have had a needle stick injury at their workplace.	13(14)
4 What the nurses did after the needle stick injury:	
a. Wash immediately with soap and water	11(84)
b. Put finger in mouth	00(00)
c. Bandaging	02(16)
d. Nothing	00(00)
5 Nurses who took post exposure prophylaxis after the injury	04(30)

About 75% of these nurses were well aware about the pre-exposure vaccinations against these diseases and said that they had taken them. While in a study in Egypt⁽¹³⁾ only 53.5% nurses were vaccinated against Hepatitis B virus. While in a study in Bangalore⁽¹⁴⁾ among dental professionals 81.5% were vaccinated against hepatitis B. In a study in Andhra Pradesh⁽¹⁵⁾ 71.1% health care providers were having knowledge about hepatitis B vaccination but only 41.7% have taken it.

79% nurses had the knowledge that washing immediately with soap and water after a needle stick injury can reduce the risk of disease transmission. This finding is higher than the study finding of Lamichanne J et al⁽¹⁶⁾ where only 48% of nurses were aware that washing immediately with soap and water is the first aid after needle prick injury. Whereas 4% of them thought that nothing should be done after a needle prick. Proper knowledge among the healthcare workers is important for prevention of any such transmission of diseases.

Findings suggest that 51% of nurses strongly felt that the hospital should organize training programs which would be beneficial in reducing transmission of blood borne infections. 70% of them strongly agreed that by following universal precautions, they could prevent needle stick injuries and they strongly disagreed on the fact that needles should be re-capped after use. 14% of nurses said that they had had a needle stick injury, 84% of which washed immediately with soap and water and only about 30% of the injured nurses were aware about post exposure prophylaxis and took it. This finding is slightly lower than the findings given by study in Uganda which showed that 59% of nurses were aware of post exposure prophylaxis.⁽¹⁷⁾ The results of this study indicate that most of the nurses follow universal precautions while handling sharp instruments whereas they have a very little knowledge regarding post exposure prophylaxis of blood borne infections. Nurses who were interviewed were also educated and counselled regarding benefits of early action following a needle stick injury and the subsequent post exposure prophylaxis which is essential to prevent them from

Recommendation Nurses should be encouraged to enroll themselves in various training programs. Hospitals should also follow a protocol on post exposure prophylaxis, each injury should be reported, looked into and recorded. This will be useful to generate awareness about the risks, hazards, and prevent these infections in the healthcare staff. This will further be helpful to reduce morbidity and mortality due to occupational transmission of blood borne pathogens in the healthcare sector in the long run.

Limitation of the study The study was limited to nursing staff only. It can be translated among other hospital staff also. Apart from medical college the study can be done in other colleges attached to university like dental.

Relevance of the study About 84% of nurses were well aware about the transmission of blood borne infections

through needle stick injuries, and 14% of nurses said that they had actually had a needle stick injury out of which only 30% of nurses took post exposure prophylaxis. There is poor awareness among the nurses regarding post exposure prophylaxis of blood borne infections.

Acknowledgement All nursing staff who cooperated during study.

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Conflict of Interest: None

Source of funding support: Indian Council of Medical Research (ICMR)

How to cite this article: Kajal Srivastava , Vaishali Kumar , Parul Sharma , J.S.Bhawalkar, Shaily Vyas. Is the awareness regarding post exposure prophylaxis of blood borne infections among nurses in a tertiary health care setting still poor?:Necessity and Challenge. Nat J Res Community Med 2018;7(3):212-15.

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NJRCM: www.commedjournal.in



ORIGINAL RESEARCH ARTICLE

DOI: 10.26727/NJRCM.2018.7.3.216-219

Year: 2018 Vol: 7 Issue: 3. Jul.-Sep. Page: 216-219

Compliance to oral iron supplementation and associated factors in antenatal mothers in tertiary care hospital, Raichur.

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Date of Submission : 09-03-2018

Date of online Publication : 15-07-2018

Date of Acceptance : 19-06-2018

Date of Print Publication : 31-07-2018

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ABSTRACT

Introduction: Anaemia is highly prevalent among pregnant women in developing countries and iron deficiency is the most important cause. India has national programme to give pregnant women iron supplements. But still anemia continues to be a major health problem in pregnancy because of poor patient compliance. **Objectives:** To study the compliance and also to study factors associated with non-compliance to oral iron and folic supplementation among pregnant women. **Methodology:** This descriptive cross-sectional study included 400 pregnant women in their second or third trimester on Iron and folic acid supplementation in tertiary hospital, Raichur. Data was collected by interview method using structured questionnaire. Missing >2 doses consecutively was considered non-compliance. **Results:** Most of the subjects (49.2%) were below 25 year of age, 47.7% of subjects had education upto primary school and 65.5% belonged to lower socioeconomic status. Overall, compliance with IFA tablets was 30.8%. Compliance was associated with higher age, education, socio-economic status and period of gestation. Forgetfulness (65.5%) and both perceived as well as experienced side effects of IFA therapy were the major factor for non-compliance. **Conclusion:** There was a low level of compliance towards IFA tablets. By providing health education to pregnant women with clear instructions about iron-folate tablet intake and its health benefits can increase compliance.

Key-words: Anemia, Compliance, Pregnant women, Iron and Folic acid supplementation.

INTRODUCTION

Anemia is the most common medical disorder during pregnancy. According to the reports of World Health Organization 35% to 75% (56% on average) of the pregnant women in developing countries are anemic¹. It is estimated that as many as 20% of maternal deaths are directly caused by anaemia through its complications and it is an associated cause in as many as 50% of maternal deaths worldwide². The World Health Organization (WHO) defines anaemia as blood hemoglobin concentration less than 11gm/dl or hematocrit less than 37% in pregnant women. Though anemia has multifaceted causes, half of its burden is attributed to iron deficiency. The National protocols in India require the provision of iron and folic acid for daily consumption to all Pregnant women for 100 days³ so that the level of anaemia at term could be reduced to the best possible extent. Response to iron deficiency anemia is related to the dose and schedule of a iron tablets and diet. But still anemia continues to be a major health problem in pregnancy because of poor patient compliance to oral iron therapy. Compliance may be defined as the extent to which behaviour of the subject coincides with medical or health advice⁴. Thus compliance is essential for Iron Folic Acid therapy which in turn is influenced by several Patient and social and demographic factors. With this

background, following study was carried out in tertiary care hospital, Raichur to know the compliance with oral iron supplementation among pregnant women.

Objectives: To study Compliance in relation to intake of oral iron and folic supplementation among pregnant women; To know the patient, social and demographic factors associated with non-compliance to oral iron and folic supplementation among pregnant women.

METHODOLOGY

This is a cross sectional study which was carried on 400 Antenatal mothers (16-36 weeks) who were routinely attending antenatal clinic of Tertiary care hospital (Navodaya Medical College and Hospital) Raichur for a period of 4 months (August –November 2016). Sample size was calculated using the formula, $n = \frac{4pq}{l^2}$ [where p is prevalence of anemia among antenatal women = 56%³ and q = 100-p = 44 %, l = 10% as non-response rate]. The subjects were selected using non-random sampling method (convenient sampling) till the required sample size of 400 was reached. The study was carried out by interview method using structured questionnaire. The

questionnaire was translated in local language for better understanding of the study subjects. Missing 2 or more doses consecutively is usually considered as non-compliance⁵.

The outcome for this study, compliance to IFA supplement, was assessed based on the reported number of IFA tablets taken from 4th month of pregnancy till the time of study. Pregnant mothers who missed two or more expected dose consequently of the iron and folic acid tablets till the time study, were considered as non-compliant with iron-folate supplement.

Those who were not willing were excluded from the study. The study was carried after obtaining clearance from the Institutional Ethics Committee (IEC) and written informed consent was taken from each subjects. Data was entered in excel sheet and analysed using SPSS v17.0. P value of <0.05 was considered significant.

RESULTS

In the present study, out of 400 antenatal women, majority 70.1% were below 30 years of age and as many as 49.2% were below 25 year of age. In our study 47.7% of subjects had education up to primary school and 8% were illiterate. Most of the subjects (66.2%) were housewives while 33.2 % were working, out of which 15.3% were engaged in farming activities, 5.4% were working as domestic help, remaining 12.5% were involved in Teaching, office work etc.

Table 1: Socio-demographic Profile of study subject

Variables	Frequency(n) (n=400)	Percentage (%)
Age		
<25years	197	49.2
>=25 years	203	50.8
Education		
Illiterate	32	8
Primary	191	47.7
High school	102	25.5
PUC/Degree	75	18.8
Occupation		
Housewife	267	66.8
Working	133	33.2
Socio-economic status*		
Class I and II	32	8
Class III	106	26.5
Class IV and V	262	65.5
Period of Gestation		
4-6 months	253	63.2
6-9 months	147	36.8

*Modified BG Prasad socio-economic classification⁶

Table 2: Reason for non-compliance to IFA among study subjects

Reason for non-compliance	Number (n)	Percentage(%)
Forgetfulness	262	65.50%
Pregnancy complications	199	49.70%
Side effects	191	47.70%
Poor quality medicines	177	44.20%
Long duration of intake	122	30.50%

Table 3: Association of compliance to IFA to its determinants among Study subjects

Determinants	Compliance		Chi Square	P Value
	Yes	NO		
Age				
<25years	48	149	7.431	0.006*
>=25 years	75	128		
Education				
Illiterate /Primary	70	153	14.361	0.001*
High school	42	60		
PUC/degree	11	64		
Occupation				
HouseWife	93	174	6.282	0.012*
Working	30	103		
S.E.S				
Class I&II	10	22	6.801	0.033*
Class III	43	63		
Class IV & V	70	192		
Order of Pregnancy				
Primi	87	176	1.957	0.162
Multi Gravida	36	101		
Period Of Gestation				
4-6 months	66	187	7.03	0.008*
6-9 months	57	90		

*P value <0.05 is highly significant

In the present study majority 65.5% of the study population belonged to Class IV and V, 8% belonged to Class I and II according to modified B G Prasad socio-economic classification. Majority 63.2% of subjects were in 4-6 months of gestation. (See table1).

In the present study only 30.8% of study subjects consumed all the IFA tablets given to them while 69.2% missed two or more doses of IFA tablets consequently. Thus, the compliance towards IFA tablets was only 30.8%.

The main reason for missing the IFA tablets were forgetfulness (65.5%).This was followed by pregnancy complications (49.7%) as they had to take multiple medicines. Antenatal women who suffered side effects (47.7%) due to IFA tablets either discontinued or consumed irregularly leading to non-compliance. Among

the other reasons for non-compliance were not liking pharmaceutical preparations (44.2%) or poor quality of IFA tablets supplied by government and long duration of IFA tablets (30.5%). (Table 2)

The most common side effects perceived by antenatal women were Gastritis 21.8 % followed constipation 12.2%, vomiting 7.5%, nausea 4 %, and unpleasant taste 2.3 %.

The compliance was higher among the subjects with higher age, higher education and those belonging to higher socioeconomic class and those who were in later months of gestation. These were found to be statistically significant ($p < 0.05$). While the compliance was more in primi-gravida but the association was not significant. (Table 3)

DISCUSSION

In this study only 31% of study subjects were found compliant to IFA tablet supplement which is much lower compared with the study done by Godara et al⁴ which observed compliance of 80.47% , and also study by Alparani Dutta⁷ which had compliance rate of 61.7%. Some of the previous studies done in Karnataka State in 2006 and 2009^{8,9} also had higher compliance .While it can be comparable to study done in Ethiopia by Abinet Arega¹⁰ and Anil Bilimale¹¹ which had compliance of 39.2% and 43% respectively. The probable reason for lower compliance in our study may be that compliance is self reported by the study subjects and missing two or more doses consequently is considered as non-compliance. Other reasons might be the difference in geographic locations and the time gap between studies and study subjects.

In this study, the compliance was better among the educated, women belonging to higher socioeconomic status and those were in later months of gestation. These results are similar to the study by Godara et al⁴ and P Mithra³. Women with higher educational level may have better knowledge about Iron deficiency anaemia and its treatment so are more compliant.

In this study, compliance was better among housewives as compared to working women. Working women tend to forget to take the IFA tablets due to their busy schedule.

In this study, Forgetfulness (65.5%) was the major reason for non-compliance. These results are in agreement with previous studies by P Mithra³, Virender Gautam et al¹² and P.L Lutsey¹³. Skipping dose due to side effects (47.7%) was the third most common reason while in studies by Godara et al⁴, Iyenger L¹⁴ and Kumar S¹⁵ it was found to be the most common reason. While Fear of side effects was predominant reason in studies by S. Gebremedhin¹⁶ and A. B. Taye¹⁷.

In our study it was observed that some women not liking due to poor quality of IFA tablets supplied by

government, studies by Godara et al⁴ and Rao demonstrated similar results.

Conclusion:

This study shows that the compliance is very low less than 50% and is related to the education, socio-economic status, working status and period of pregnancy. The main reason for non-compliance was forgetfulness followed by fear of side effects.

Recommendations:

Though the existing IFA supplementation programs for pregnant women are effective in raising hemoglobin levels, still majority remain anemic. Thus there is a need for better operational strategies like establishing a good health provider patient relationship. This may ensure regular intake, by providing health education to pregnant women by giving them complete instructions, such as dosage, duration, benefits of IFA tablets, side effects and what should be done when experiencing side effects.

Limitations:

The limitations of this study being its cross-sectional nature as such no follow up was done and there are chances of recall bias among the subjects. Skipping two or more doses was considered as non-compliance leading to very low compliance in this study.

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hospital, Raichur. Nat J Res Community Med 2018;7(3):216-219.

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Conflict of Interest: None

Source of funding support: Nil

How to cite this article: Lakshmi Devi, Arshiya Taranum. Compliance to oral iron supplementation and associated factors in antenatal mothers in tertiary care

ORIGINAL RESEARCH ARTICLE

DOI: 10.26727/NJRCM.2018.7.3.220-222

Year: 2018 Vol: 7 Issue: 3. Jul.-Sep. Page: 220-222

PREVALENCE OF PULMONARY TUBERCULOSIS AMONG HIV SEROPOSITIVES ATTENDING ART CLINIC OF A TERTIARY CARE HOSPITAL, NELLORE, A.P.

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Date of Submission : 09-06-2018

Date of online Publication : 18-07-2018

Date of Acceptance : 19-06-2018

Date of Print Publication : 31-07-2018

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ABSTRACT

BACKGROUND: The Human immunodeficiency virus (HIV) epidemic has posed major, almost insurmountable, challenges to tuberculosis (TB) control efforts across the world. The current study was undertaken to find out the socio demographic correlates of TB and HIV co-infected cases. **OBJECTIVES:** 1.To study the Prevalence of pulmonary tuberculosis (HIV/TB co-infection) among HIV seropositive patients attending the antiretroviral therapy clinic (ART) clinic of DSR Hospital, Nellore .2.To describe the socio-demographic profile of HIV seropositive patients. **MATERIALS AND METHODS:** It is a cross sectional, record based study conducted at the ART clinic of DSR Hospital, Nellore. All the HIV seropositive patients, who attended ART clinic from October 2016 to December 2016, receiving ART treatment during the study period, were included in the study. Data is entered in MS Excel and statistical analysis is done using SPSS software (Version 17.0). **RESULTS:** In this study, out of the total 304 HIV seropositive patients, who attended the ART clinic and received treatment, 41 (14%) had HIV/TB co-infection and remaining 263 (86%) were HIV seropositive alone i.e, prevalence of HIV-TB co infection in this study was found to be 14% ($n = 304$), of which 63.4% were males and 36.6% were females. **CONCLUSION & RECOMMENDATIONS:** The study showed that 14% of HIV seropositives had tuberculosis co-infection. TB-HIV co-infection deserves special attention as Co infection was seen to be associated with reduced CD4 counts, which could hasten the progression to AIDS. Screening of HIV among TB patients should be attached more importance, which would be much more helpful for treatment and outcome of both diseases.

Key-words: ART, HIV–TB co infection, ICTC, PTB, EPTB.

INTRODUCTION

According to the World Health Organization (WHO), TB is one of the major causes of death among HIV-infected people. The HIV epidemic has posed major and almost insurmountable challenges to TB control efforts across the world. In persons dually infected with HIV and tuberculosis, the lifetime risk of developing tuberculosis is 50%–70% as compared to a 10% risk in HIV negative individuals⁴ and TB/HIV co-infection has been found to reduce the effectiveness of Directly Observed Therapy of Tuberculosis⁵ (DOTS). Due to this relationship there has been a dramatic increase in the incidence of tuberculosis in countries with high prevalence of HIV and tuberculosis. Moreover, HIV-infected patients are more likely to experience sputum smear-negative pulmonary TB (PTB) than HIV-uninfected patients and up to one-third may demonstrate unremarkable chest radiographs. Extra-pulmonary TB (EPTB) is also more common in HIV-positive patients¹¹.

In 2016, there were an estimated 1.4 million new cases of TB amongst people who were HIV- positive. About 40% of deaths among HIV-seropositive were due to TB in 2016³. In 2016 about 0.4 million people died of HIV-associated TB. India bears the burden of 2.5 million people infected with HIV; of these 40% suffer co

infection with TB^{1, 2}. The case fatality rate (CFR) among the notified HIV seropositive TB patients in India is about 13%, which is four times higher than that among HIV-negative TB patients⁹. It is fast becoming evident that the TB population should be seen as an important cohort to screen for HIV³.

Early detection and effective treatment of TB as well as the provision of prophylaxis against TB is likely to impact favourably on the prognosis of HIV-infected patients. In this context it is imperative that India monitors and plans for HIV/TB co-infection in order to identify, treat and prevent co-infection, thereby reducing TB burden and increasing the years of healthy life of people living with HIV. The current study was undertaken to find out the socio demographic correlates of TB and HIV co-infected cases.

OBJECTIVES :1. To study the Prevalence of pulmonary tuberculosis (HIV/TB co-infection) among HIV seropositive patients attending the antiretroviral therapy clinic (ART) clinic of DSR Hospital, Nellore. 2. To describe the socio-demographic profile of HIV seropositive patients.

MATERIAL AND METHODS

It is a cross sectional, record based study conducted at the ART clinic of DSR Hospital, Nellore. Necessary clearance from the Institutional Ethics Committee was obtained before conducting the study. All the HIV seropositive patients, who attended ART clinic from October 2016 to December 2016, receiving ART treatment during the study period, were included in the study. HIV was diagnosed by performing enzyme-linked immunosorbent assay (ELISA) by using two different antigens and a rapid test as recommended by the National AIDS Control Organization (NACO). All patients were screened for PTB and EPTB with physical and sputum examinations, chest X-ray, and ultrasound of the abdomen. All personal information such as age, gender, socioeconomic background, marital status, education level, profession was collected from records of patients diagnosed with active TB by using a structured proforma. All coinfectd patients were treated with DOTS under Revised National Tuberculosis Control Programme (RNTCP). Data is entered in MS Excel and statistical analysis is done using SPSS software (Version 17.0). The descriptive methods of analysis were used to profile the patients and to determine the relative burden of TB in this ART center.

RESULTS

Figure 1: Prevalence Of TB In HIV Seropositives (n=304)

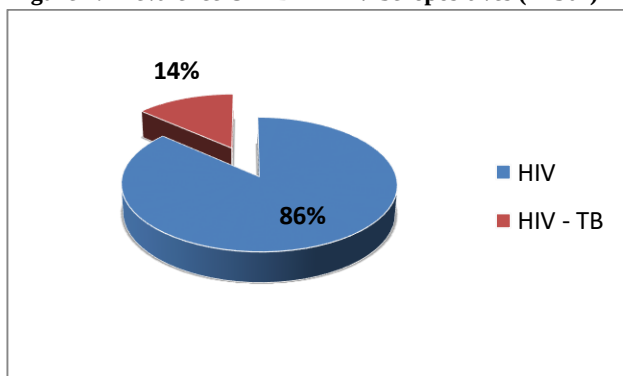
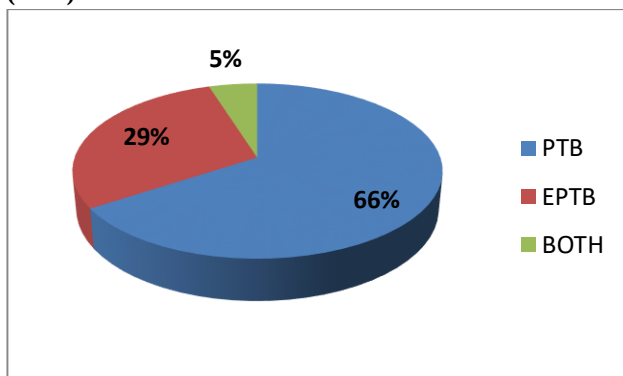


Figure 2: Types Of Tuberculosis In HIV Sero-positives (n=41)



In this study, out of the total 304 HIV seropositive patients, who attended the ART clinic and received treatment 14%(41) had HIV/TB co-infection and remaining 86%(263) were HIV seropositive alone i.e, prevalence of HIV-TB co infection in this study was found to be 14%, of which 63.4% (26) were males and 36.6%(

15) were females (figure: 1). The diagnosis of PTB 65.8 % (27) dominated followed by EPTB in 29.3% (12) (figure: 2). Majority of the patients 85.4%(35), were in the age group of 15-49yrs hailing from urban areas 75.6%(31), having secondary level of education 39%(16), working as labourers 51.2%(21) (Table 1). A significant association ($p < 0.001$) was found with occupation and sex. Unmarried 51.2 % (21) individuals were seen to have higher rates of infection which was found to be statistically significant ($P < 0.05$).

Table1: Socio Demographic Profile Of HIV-TB Coinfectd Patients (n=41)

VARIABLE	MALE No. (%)	FEMALE No. (%)	TOTAL No. (%)
Age group(yrs)			
15-49	23(88.5)	12(80.0)	35(85.4)
>50	3(11.5)	3(20.0)	6(14.6)
($\chi^2 = 0.545$, $df=1$, $p > 0.05$)			
Area			
Rural	16(51.6)	15(48.4)	31(75.6)
Urban	10(100.0)	0	10(24.4)
($\chi^2 = 7.63$, $df=1$, $p < 0.05$)			
Educational status			
Illiterate	6(23.1)	7(46.7)	13(31.7)
Primary school	8(30.8)	4(26.7)	12(29.3)
Secondary school	12(46.2)	4(26.7)	16(39.0)
($\chi^2 = 2.65$, $df=2$, $p > 0.05$)			
Occupation			
Housewife	0(0)	7(46.7)	7(17.1)
Govt. Employee	3(11.5)	0(0)	3(7.3)
Business	3(11.5)	0(0)	3(7.3)
Labourer	13(50.0)	8(53.3)	21(51.2)
Skilled Worker	7(26.9)	0(0)	7(17.1)
($\chi^2 = 19.654$, $df=4$, $p < 0.001$)			
Income(Rs.)			
<5000/Month	3(11.5)	0(0)	3(7.3)
5000-10000/ Month	20(77.0)	7(46.7)	27(65.8)
>10000/Month	3(11.5)	8(53.3)	11(26.9)
($\chi^2 = 9.24$, $df=2$, $p < 0.05$)			
Marital status			
Unmarried	13(50.0)	8(53.3)	21(51.2)
Married	13(50.0)	3(20.0)	16(39.0)
Widowed	0(0)	4(26.7)	4(9.8)
($\chi^2 = 9.148$, $df=2$, $p < 0.05$)			

DISCUSSION

This study aimed at finding out the prevalence and profile of patients with dual infection of HIV-TB. A total of 304 HIV/AIDS patients reported in the ART centre of DSR Hospital Nellore, during October 2016 to December 2016 were included in the study. Of them, 41 were found with HIV-TB co infection, which indicates 14% prevalence in this study. The prevalence is comparable with a study by R.kamath⁴ et al 18.86%. The higher proportions observed by Chakraborty et al.⁵ (57%), Ghiya et al.⁶ (49.2%) were

mainly because of the methodology they used, since in their studies, apart from standard clinical and microbiological criteria, sputum culture and serology tests were done to detect TB. The extensive investigations carried out increased the chances of diagnosing TB.

The diagnosis of PTB 65.8 % dominated followed by EPTB in 29.3% and both (PTB and EPTB) in 4.9% which is comparable with a study by R.kamath⁴ et al.

The rate of co infection with HIV–TB in this study was found to be higher among males (65.7%) in the sexually active age group of 15-49 years (85.4%), similar to Patel A.K et.al⁷ (76%), Ghiya R et.al⁶ (82.5%) studies. The middle-aged, working group are mainly prone to TB as they have more exposure at work place. This poses a great impact on the productivity of the country since the reproductive and economically productive age groups are mostly affected.

Unmarried (51.2%) individuals were found to have higher rates of infection when compared to married, divorced or widowed individuals and significant association was present ($p < 0.05$), this is in contrast to the study done by R.kamath⁴ et al, where married individuals were found to have higher rates of infection.

Prevalence was found to be more in persons hailing from rural areas (75.6%), having less than primary level of education (60.9%), working as labourers (51.2%) and having low income-earning capacity (51.2%) similar to other studies by R.kamath⁴, Ghiya R et.al⁶, Gupta P et al⁸ (48.2%). The labourers were found to be more vulnerable which may be due to the fact that majority of them were migrants.

CONCLUSION AND RECOMMENDATIONS: The study showed that 14% of HIV infected persons had tuberculosis co-infection. Since the increase in HIV infection rate leads to increase in tuberculosis disease, there is need to re-examine the strategies for their effective control. A strong coordination between the National TB and the AIDS control programmes is required for effective management of HIV-TB patients. It is imperative that physicians treating HIV-infected patients should aggressively identify those with M. tuberculosis in order to reduce the associated co morbidity resulting from the pairing of the infections, notwithstanding the imminent threat of multidrug-resistant and extremely drug-resistant TB on the rise. Greater focus of health interventions should be on the rural population as 75.6% of those co infected were from rural areas in this study. Creating grass root level awareness coupled with aggressive case finding in suspected high-risk population may be the key in preventing and early detection of the dual infections.

LIMITATION OF STUDY: This study was conducted at the ART centre of Tertiary Care Hospital that is situated in the District headquarters and clients from surrounding area can avail the services which could bias

study results. This is a record-based study and a direct interview with the clients would have been better to get additional information.

ACKNOWLEDGEMENTS: We thank the staff of ART Centre for providing necessary data.

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Conflict of Interest: None

Source of funding support: Nil

How to cite this article: Bhuvaneswari P, Susmitha KM, Sujatha P, Kiran DK. Prevalence Of Pulmonary Tuberculosis Among HIV Seropositives Attending Art Clinic Of A Tertiary Care Hospital, Nellore, A.P.Nat J Res Community Med 2018;7(3):220-222.

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NJRCM: www.commedjournal.in

ORIGINAL RESEARCH ARTICLE

DOI: 10.26727/NJRCM.2018.7.3.223-228

Year: 2018 Vol: 7 Issue: 3. Jul.-Sep. Page: 223-228

Pattern Of, And Risk Factors For Physical Activity Among Medical Students In A Private Institution

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Date of Submission : 06-07-2018

Date of online Publication : 21-07-2018

Date of Acceptance : 20-07-2018

Date of Print Publication : 31-07-2018

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ABSTRACT

Background: Physical activity refers to bodily movement generated by skeletal muscles, and involving expenditure of energy. The lack of adequate physical activity is an established behavioural risk factor for the development of several non-communicable diseases. The global prevalence of physical inactivity among adults is around 23%. **Objectives:** 1) To determine the prevalence and pattern of physical activity among medical students; 2) To investigate the relationship between physical activity and selected physical measures associated with risk of developing non-communicable diseases; and 3) To ascertain the factors associated with performance of adequate physical activity among medical students. **Methodology:** This cross-sectional study was performed among medical students and interns of a private medical college in Kerala using the Global Physical Activity Questionnaire. Waist circumference, waist-hip ratio, Body Mass Index and resting pulse rate were measured using standard procedures. **Results:** 57 (24.1%) of subjects had inadequate physical activity (<600 MET/ week). 210 (88.9%) of subjects had suboptimum resting pulse rate (≥ 65 beats per minute). 201 (85.2%) of subjects had an abnormal waist-hip ratio. 167 (70.7%) of subjects had a waist circumference at or above Action Level 2. 56 (23.73%) of the subjects reported a daily sitting time of more than 480 minutes. Performance of adequate physical activity was significantly associated with male sex, year of study, and less than 480 minutes of daily sitting time ($p < 0.05$). Females were significantly more likely to have a daily sitting time of >480 minutes ($p < 0.0001$); and not to mention physical activity as a means of improving physical fitness ($p: 0.002$). **Conclusions:** Physical activity is significantly associated with sex, year of study, and daily duration of sitting.

Key-words: Physical activity, GPAQ, medical students

INTRODUCTION

Physical activity (PA) refers to any bodily movement produced by skeletal muscles that uses energy.¹ Inadequate PA is an established independent causal risk factor for ischaemic stroke, type 2 diabetes, ischaemic heart disease, breast cancer and colon cancer.^{2,3} Globally, around 23% of adults lack adequate PA.⁴ Apart from being the fourth leading risk factor for death globally, physical inactivity cost health-care systems INT\$67.5 billion, with low and middle-income countries (LMICs) bearing 75% of the disease burden.^{5,6}

Physical activity has been identified as an important factor in the progress and achievement of Sustainable Development Goals (SDGs).⁷ An increase in PA will directly contribute to the achievement of good health and well-being (SDG3); ending all forms of malnutrition (SDG2.2); quality education (SDG4.1 and 4.2); gender equality (SDG5.1); decent work and economic growth (SDG8); industry, innovation and infrastructure (SDG9.1); reduced inequalities (SDG10.2 and 10.3); sustainable cities and communities (SDGs 11.2, 11.3,

11.6 and 11.7); responsible production and consumption (SDGs 12.8 and 12c); peace, justice and strong institutions (SDGs 16.1 and 16b); climate action (SDGs 13.1 and 13.2); life on land (SDGs 15.1 and 15.5); and partnerships (SDG17).¹

In addition to providing protective benefits- such as maintenance of physical, social and mental health (including the prevention or delay of dementia); prevention of falls; and healthy ageing, physical activity is also associated with academic performance.^{1,2,8}

Health-care professionals are at substantial risk for physical inactivity, and inactive behavior may commence during training.⁹⁻¹³ Considering that health-care professionals are a valuable resource, and are expected to model healthy behaviours, investigation of their physical activity patterns would enable identification of areas for targeted intervention(s), as well as institution of remedial measures at an early stage. This is required to protect the health of the health-care professionals, and ensure their

availability to address the health needs of the community at large.

Although some studies have examined the practice of physical activity among medical students, they have often been conducted outside India, limiting their utility in the Indian context.^{12,14,15}

Objectives

This study was conducted to 1) determine the prevalence and pattern of PA among medical students; 2) investigate the relationship between PA and selected physical measures associated with risk of developing non-communicable diseases (NCDs); and 3) ascertain the factors associated with performance of adequate PA in the study population.

METHODOLOGY

Participants

This cross-sectional study was conducted between September to October 2016 in a private medical college in south Kerala. Permission to conduct the study was obtained from the head of the department. The study population consisted of consenting medical students and interns between the ages of 18 and 30 years. Since first year MBBS students were unavailable on account of examinations, the study was restricted to the remaining students. Stratified random sampling was employed (with each year of study taken as a stratum), and systematic random sampling was performed within each stratum.

Sample size

The prevalence of physical activity in urban areas of Tamil Nadu is reported to be 29%.¹⁶ This was assumed to be comparable with the physical activity level in south Kerala, hence was taken for sample size calculation.

Sample size was calculated using the formula $4Pq/l^2$

where p is prevalence

q is (100-p)

l is 20% of p

$$\text{Sample size} = 4 \times 29 \times (100-29) / (20/100)^2 \times 29 \\ = 244$$

Measures

Sociodemographic and physical attributes

A self-administered, semi structured questionnaire was used to collect details regarding age, sex, year of study, marital status, and perceived fitness level. Subjects were asked if they were satisfied with their level of fitness, and how to improve the same. In addition, questions pertaining to weight gain in the preceding six months, and reasons for the change were asked. Physical measurements were obtained immediately after administration of the questionnaire.

Physical measurements such as waist circumference (WC), hip circumference (HC), waist-hip ratio (WHR), weight (Kg), height (cm), resting heart rate (RPR), and body mass index (BMI) were obtained by the authors using standard procedures.^{17,18} Weight and height were measured to the nearest 0.1 kg and 0.1 cm respectively, using a free standing stadiometer with digital weighing

scale (Model WS703, Narang Medical Limited, Delhi). Both weight and height were measured twice, and the average was used to compute BMI. The weighing scale and stadiometer were calibrated with standard weight and height on each day of data collection. Waist and hip circumference were measured using an inelastic measuring tape. RPR is an independent indicator of cardiovascular fitness, with lower values usually indicating greater cardiovascular efficiency.^{19,20}

Studies have shown that there are important differences in adiposity between south Asians and other races. Therefore, lower cut-offs for WC have been suggested for them.^{18,21} Specifically, south Asians demonstrate greater adiposity at the same BMI level; have a tendency for greater visceral adiposity; and manifest overt disease (like type 2 diabetes) at lower levels of WC and BMI than established as global thresholds for intervention.²¹ This has resulted in the development of separate (lower) cut-off levels for south Asians (including Indians). The Association of Physicians in India has suggested two Action Levels to facilitate risk screening and inform management. Action Level 2 corresponds to the threshold for definite action/ intervention to reduce WC.²¹

The following cutoff points were employed for the physical measurements:

Waist circumference- Men: 90 cm Women: 80 cm
(corresponds to Action Level 2)²¹

Waist-Hip Ratio- Men: 0.9 Women: 0.8 (appropriate for South Asians)¹⁸

BMI- Underweight: <18.5 Normal: 18.5-24.9

Overweight: 25.0-29.9 Obese: ≥30.0¹⁸

Resting Pulse Rate- Abnormal: ≥65 beats/ minute²⁰

Physical Activity

Physical activity was assessed using the Global Physical Activity Questionnaire (GPAQ) (version 2.0), a validated tool that has been developed by the World Health Organization (WHO) for epidemiological surveillance.²² The tool captures PA across three domains- work, transportation, and leisure time- and intensity levels (vigorous, moderate, and low) over a typical week. In addition, it collects details regarding frequency of PA; and time spent sitting daily.^{14,22} The GPAQ was administered through face-to-face interview by the authors. Sitting for more than 3 hours a day is associated with an increased risk of mortality in all but the most active.²³ However, sedentary behavior involves sitting for more than 8 hours per day, therefore 480 minutes was taken as the threshold for categorization.^{23,24}

Estimation of Energy Expenditure

Energy expenditure was estimated using metabolic equivalent of task (MET) per week, as indicated by the PA reported in GPAQ. One MET is equal to the energy cost of sitting quietly (1 kcal/kg/min). Moderate-intensity activities are assigned a value of 4 METs; while vigorous activities are assigned a value of 8 METs. The total MET/week is determined by adding the METs for all PA in the week. The GPAQ framework classifies PA variously as

- Adequate (≥600 MET/week) / Inadequate (<600 MET/week); and

- b. High (≥ 3000 MET/week) / Moderate (≥ 600 MET/week) / Low (<600 MET/week)^{14,25}

Statistical analysis

Data entry was performed using Microsoft Office Excel 2013, and analyses were performed using EZR (version 1.36) [R Commander version 2.4-0; R version 3.4.1].²⁶ Data were analysed in accordance with the GPAQ analysis guide.²⁵ In addition, descriptive statistics, chi-square tests, independent samples t-test, and logistic regression were performed.^{27,28} Statistical significance was set at the 5% level.

The data were cleaned to exclude improbable responses (16 hours or more of physical activity in a day, etc.). This resulted in the exclusion of eight respondents from analysis, reducing the available sample to 236 subjects (95% of the original estimated sample size).

RESULTS

Of the respondents, 79 (33.5%) were male, while 157 (66.5%) were female. Year-wise details of study subjects is provided in Table 1. 57 (24.1%) of subjects had inadequate physical activity (<600 MET/ week). 210 (88.9%) of subjects had suboptimum resting pulse rate (≥ 65 beats per minute). 201 (85.2%) of subjects had an abnormal waist-hip ratio. 167 (70.7%) of subjects had a waist circumference at or above Action Level 2. Overall, the proportion of subjects classified as underweight (18(7.63%)); normal BMI (151(63.9%)); overweight (61(25.8%)); and obese (6(2.5%)) were comparable across strata. The mean time spent sitting by subjects was 348.8 minutes per day. Only 56(23.73%) of the subjects reported a daily sitting time of more than 480 minutes. Female subjects were 4.6 times more likely to report a daily sitting time of more than 8 hours (95%CI: 1.9-12.8; $p<0.0001$).

Table 1. Details of stratified sampling

Year of study	Number of students		Sample characteristics		
	Male	Female	Male	Female	Total
2 nd MBBS	33	61	21	32	53
3 rd MBBS	35	67	21	42	63
Final year	34	52	20	38	58
Internship	27	86	17	53	70
Total	129	266	79	165	244

The baseline characteristics of the study sample disaggregated by sex are provided in Table 2.

Although there was a predominance of female subjects, there was no statistically significant difference in the proportion of male to female subjects across the years of study. Similarly, there was no significant difference in age, resting pulse rate, or mean hip circumference between male and female subjects.

There was a statistically significant difference between male and female subjects in terms of their BMI- both mean BMI ($p: 0.001$); and BMI classification ($p: 0.003$). Statistically significant differences were also present in

waist circumference ($p <0.001$); waist-hip ratio ($p <0.001$); and MET per week ($p <0.001$).

Table 2. Sex disaggregated characteristics of study subjects*

Variable	Level	Male (79)	Female (157)	P value
Year of study	2 nd MBBS	21 (26.6%)	32 (20.4%)	0.2
	3 rd MBBS	21 (26.6%)	37 (23.6%)	
	Final year	20 (25.3%)	35 (22.2%)	
	Internship	17 (21.5%)	53 (33.8%)	
	Underweight	0 (0.0%)	18 (11.5%)	
BMI	Normal	52 (65.8%)	99 (63.1%)	0.003
	Overweight	24 (30.4%)	37 (23.6%)	
	Obese	3 (3.8%)	3 (1.9%)	
Age		22.47 $\pm$ 1.77	22.37 $\pm$ 1.57	0.6
BMI		24.24 $\pm$ 3.22	22.71 $\pm$ 3.25	0.001
Hip circumference		93.84 $\pm$ 7.78	92.21 $\pm$ 9.93	0.2
Waist circumference		92.43 $\pm$ 7.04	82.60 $\pm$ 9.22	<0.001
Waist-Hip Ratio		0.98 $\pm$ 0.08	0.89 $\pm$ 0.06	<0.001
MET per week		2123.04 $\pm$ 1285.85	1291.72 $\pm$ 1058.62	<0.001
Resting Pulse Rate		76.49 $\pm$ 8.66	75.46 $\pm$ 8.89	0.4
Sitting time per day		279.93 $\pm$ 127.06	383.43 $\pm$ 185.99	<0.001

*Results are presented as Mean $\pm$ Standard Deviation or n(%)

Subjects were asked if they were satisfied with their fitness level, and how it could be improved. 129 (54.66%) were satisfied with their fitness level. Of the remaining 107, 63(58.8%) mentioned exercise; 39(36.4%) mentioned diet; 3(2.8%) mentioned diet and exercise; and 2 (1.8%) mentioned yoga as means of improving fitness. Among those unsatisfied with their fitness, male subjects were 4.2 times more likely to mention exercise as a means of improving fitness as compared to female subjects (95% CI: 1.48-14.05; $p: 0.002$). While 96 (40.7%) subjects indicated that they had maintained their weight over the preceding six months, 72 (30.5%) had gained weight, and 68 (28.8%) had lost weight during the same time period. Among those who had gained weight, the commonest explanations offered were that they were too lazy to work out (43(69.3%)); and stress/ illness (14(22.6%)). There was no statistically significant difference between male and female subjects regarding reason for weight gain ($p: 1$). Analysis of Variance (ANOVA) revealed that there was a statistically significant difference in MET/week between interns and other students ($p<0.001$). Post-hoc test (Tukey) revealed that there was a statistically significant difference in physical activity level between interns and second year students ($p<0.001$); interns and third year students ($p<0.001$); and interns and final year students ($p<0.001$). There was no significant difference between second, third and final year students in terms of physical activity level.

The relationship between adequate physical activity and selected factors is presented in Table 3.

Table 2. Relationship between adequate/ inadequate physical activity and selected factors*

Variable	Level	≥600 MET/ week (n=179) (n(%))	<600 MET/ week (n=57) (n(%))	P value
Resting Pulse Rate	≤65 beats/ min	19(10.6%)	7(12.3%)	0.8
	>65 beats/ min	160(89.4%)	50(87.7%)	
BMI	Overweight/ Obese	44(24.6%)	23(40.4%)	0.028
	Others	135(75.4%)	34(59.6%)	
Time sitting/ day	<480 minutes	145(81.0%)	35(61.4%)	<0.0001
	≥480 minutes	34(19.0%)	22(38.6%)	
Satisfied with fitness?	Yes	104(58.1%)	25(43.9%)	0.06
	No	75(41.9%)	32(56.1%)	
How to improve fitness	Exercise	51(68.0%)	15(46.9%)	0.051
	Others	24(32.0%)	17(53.1%)	
Weight status in last 6 months	Gained	48(26.8%)	24(42.1%)	0.033
	Others	131(73.2%)	33(57.9%)	
Reason for weight gain	Too lazy to work out	26(63.4%)	17(81.0%)	0.24
	Others	15(36.6%)	4(19.0%)	
Waist Circumference	Normal	17(9.5%)	2(3.5%)	0.17
	Abnormal	162(90.5%)	55(96.5%)	
Waist Hip Ratio	Normal	26(14.5%)	9(15.8%)	0.83
	Abnormal	153(85.5%)	48(84.2%)	
Waist circumference Action Level	Action Level 2	122(68.2%)	45(78.9%)	0.13
	Others	57(31.8%)	12(21.1%)	

*Results are presented as n(%)

Logistic regression analysis was performed with MET/week as the dependent variable, and factors that had achieved statistical significance as independent variables. For the purpose of this analysis, year of study was transformed to a binary variable with two levels- interns; and others. The results of logistic regression analysis revealed that sex, year of study, and daily sitting time were significantly associated with adequate physical activity. Male students were 5.8 times more likely to have adequate physical activity than their female counterparts (95% CI: 2.1-16.0; p: 0.0006). Similarly, year of study was significantly associated with adequate physical activity- students were 5.2 times more likely to have adequate physical activity than interns (95% CI: 2.6-10.4; p<0.0001). Daily sitting time of less than 480 minutes was 2.3 times likely to be associated with MET/week of ≥600 (95% CI: 1.1-4.8; p: 0.02).

DISCUSSION

Overall, the prevalence of physical activity among medical students was 75.85%, with males significantly more physically active than females. This is consistent with the findings reported by WHO, and several

investigators.^{2,4,6,9,12-16,29-31} Although the overall figure is respectable, it conceals considerable inactivity on the part of both females and interns. According WHO, globally around 23% of adults aged 18 and above were not active enough in 2010, which is comparable to that in our study (24.15%).⁴

46.5% of the interns were physically inactive, and students were more physically active compared to interns. The observation that year of study influences physical activity levels is consistent with that reported by Wattanapisit et al, who reported greater physical activity in preclinical students.¹² The possible explanation for the reduced physical activity could be erratic work and sleep timings during internship. Under such circumstances, it would be difficult to maintain a physical activity regimen. The main reason for physical inactivity in this study was laziness (69%). This is consistent with the findings of Gadhvi et al, who reported that 57% of the subjects in their study cited laziness as the reason for inadequate physical activity.⁹ This finding is important as it suggests that mere knowledge of the importance of physical activity is insufficient to effect behavioural change, or generate sufficient motivation to result in regular physical activity.

Sitting for at least eight hours on a daily basis was identified as a significant risk factor for inadequate PA. This is consistent with literature, and highlights the need to reduce sitting time as a proportion of one's daily routine. Since a reduction in sitting time alone does not lower the risk for developing non-communicable diseases or premature mortality, a reduction in sitting time should be accompanied with a corresponding increase in moderate-vigorous physical activity.^{23,32}

Male subjects had significantly higher waist circumference and waist-hip ratios compared to their female counterparts. However, there was no such relationship between PA and either measure. This may be on account of variations in perceived effort of PA- those who are obese would perceive less intensive activities to be strenuous, thus reporting greater intensity of PA. It is suggested that adiposity may influence PA, as opposed to physical inactivity leading to overweight and obesity.³³ Perhaps, the relationship between obesity and physical inactivity is similar to a closed feedback loop, where the presence of one results in the other, and so on. Simultaneously, the findings may reflect the tendency of the GPAQ to significantly underestimate sedentary behavior.³⁴ It is also possible that the PA guidance is misinterpreted, and thus individuals fail to acquire cardiovascular benefits, since the greatest magnitude of benefit is available at considerably higher METs than the 600 MET/week recommendation by WHO.^{3,35} Interestingly, female subjects indicated a preference for improving fitness by engaging in non-exercise activities (like dieting). This aversion to PA possibly stems from the mistaken belief that weight and BMI are more important than WC, WHR or RPR. It could also be reflective of greater importance being placed on physical appearance than physical fitness. This prioritization is

flawed, as engaging in regular physical activity will usually have positive effects on one's physical appearance, but the reverse is not necessarily true. These factors may also explain the lack of association between RPR and PA levels in this study, since regular aerobic activity generally results in an improvement in heart rate variability; and lower resting heart rate.²⁰ With less regular and/or less intense physical activities, it is possible that the modulation of cardiac rhythm occurs much less perceptibly and slowly.

Limitations

It is difficult to establish a causal relationship between physical activity and the factors under consideration due to the cross-sectional nature of the study. Similarly, we were unable to verify PA levels using an independent measure (like an accelerometer or sensors).

Conclusions

Adequate physical activity was more among males students, and those sitting for less than eight hours a day. Subjects cited laziness as the main reason for inadequate physical activity. Sedentary behavior was significantly higher among females. Female subjects were more likely not to mention exercise as a means to improve physical activity.

Efforts to increase PA levels should be population-wide, and preferably commence during adolescence.¹ In India, this could be achieved through effective implementation of programs like the Rashtriya Kishor Swasthya Karyakram (RKSK).³⁶⁻³⁸ These interventions should continue through adulthood, and into old age. This would ensure a culture of physical activity across various life stages, and possibly offset the impacts of sedentary behavior.

Recommendations

The practice of physical activity among medical students should be incentivized, and dedicated time made available for the same throughout their period of training.

Interventions to increase physical activity should focus on female subjects, and emphasize PA over maintenance of body weight.

ACKNOWLEDGEMENT

We would like to thank all the students and interns who participated in this study.

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Conflict of Interest: None

Source of funding support: Nil

How to cite this article: Liaquat Roopesh Johnson, Chithra Chandran Prabha, Deepa Prakash, Drisya Gopinath Vasantha, Geethanjali Mohandas, Karthika Reghunath, Muhsina Peediakal Padinjarai, Rabina Rasheed, Vishnu Satheeshan. Pattern of, and risk factors for physical activity among medical students in a private institution. *Nat J Res Community Med* 2018;7(3):223-228.

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NJRCM: www.commedjournal.in

ORIGINAL RESEARCH ARTICLE

doi: 10.26727/NJRCM.2018.7.3.229-232

Year: 2018 Vol: 7 Issue: 3. Jul.-Sep. Page: 229-232

PREVALENCE OF ANXIETY AND DEPRESSION AMONG MEDICAL STUDENTS OF DECCAN MEDICAL COLLEGE, HYDERABAD.

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Date of Submission : 25-06-2018

Date of online Publication : 27 -07-2018

Date of Acceptance : 20-07-2018

Date of Print Publication : 31-07-2018

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ABSTRACT

Background: Different Studies on depression in medical students have shown high prevalence of 20-30%. Anxiety especially in new medical students and during examination periods is another common mental health problem that needs attention, as very few Medical students seek medical/psychiatric help for these problems. **Objectives:** To assess the prevalence of Depression Anxiety and Stress in Medical students. To assess the patterns of Depression, Anxiety and Stress in relation to the severity and distribution among Medical students. **Methodology:** A cross-sectional study was conducted in the month of November 2017 in Deccan College of Medical Sciences, Hyderabad. Approval was obtained from Institutional ethical committee. A total of 275 Final MBBS [part-I (175) and Part-II (100)] students were selected for the study. Written informed consent was taken from study population that is the whole batch. Those students who were absent on the day of data collection and those who did not give consent to participate in study were excluded from the study. Incomplete responses where students have not attempted at least one options of the questioner were also excluded. Depression, Anxiety and Stress Scale - 21 Items (DASS-21) was used for data collection. DASS-21 is a set of three self-report scales designed to measure the emotional states of depression, anxiety and stress. **Results:** A total of 275 Students were included in the study of which 175 were studying in Final year part-I and 100 in Final year Part-II, 65% were female and 35% were male students. Average age of the student was 20.3 years. We found that prevalence of depression among medical students were 28.72%. Among them 2.18 % had severe depression and 1% extremely severe depression. **Conclusion:** Around one third of the Medical students reported features of Depression and more than half reported features of Anxiety. Early recognition of vulnerable students like Failures, students with Language problems and learning difficulties, students from low socio-economic strata and their effective counseling at early stages by teachers will go long way in making of confident doctors and confident and proficient medical fraternity. Setting up students counseling centers at medical colleges where students can approach to discuss their difficulties, regular orientation and motivational programmers, change in approach of teaching from inimically authoritative to more benevolent and empathetic are other approaches that need serious considerations.

Key-words: Anxiety, Depression, Medical students, Stress, Hyderabad.

INTRODUCTION

Medical schools are known to be stressful environments for students and hence medical students have been believed to experience greater incidences of anxiety and depression than others. In fact Medical school has quite a few risk factors for depression and stress related conditions like long working hours, lack of sleep, heavy workload, fear of failure, maladjustment to stay conditions and lack of proper peer support. Different Studies on depression in medical students have shown high prevalence of 20-30%.[1][2] Anxiety especially in new medical students and during examination periods is another common mental health problem that needs attention, as very few Medical students seek medical/psychiatric help for these problems.[3] Although

ample data in this regard is available and a few meta-analysis done but most of these studies come from western countries. Indian studies to document burden of anxiety and depression in medical students and its impact on their academic performance are few specially from Telangana region of South India.[4][5] Hence this study is undertaken to evaluate the Anxiety and Depression among undergraduates of Deccan medical college Hyderabad.

MATERIAL & METHODS

A cross-sectional study was conducted in the month of November 2017 in Deccan College of Medical Sciences, Hyderabad. Approval was obtained from Institutional

ethical committee. A total of 275 Final MBBS [part-I (175) and Part-II (100)] students were selected for the study. A written Informed consent was taken from study population. Those students who were absent on the day of data collection and those who did not give consent to participate in study were excluded from the study. Incomplete responses where students have not attempted at least one options of the questioner were also excluded. Depression, Anxiety and Stress Scale - 21 Items (DASS-21) was used for data collection. DASS-21 is a set of three self-report scales designed to measure the emotional states of depression, anxiety and stress. Each of the three parameters (Depression, Anxiety and Stress) is evaluated using seven questions, responses to which are graded from "0" (Do not apply to me) to "3" (Apply to me very much most of the time). The scores in each category have to be multiplied by 2 to get the final score. Table 1 gives the classification of Depression, Anxiety and Stress of with respect to final DASS-21 Scores.[6]The response was sought in a self-reported, anonymous fashion. Data were entered in excel and analyzed using SPSS (version:16). Chi Square test were applied and P value of <0.05 was considered as statistically significant.

RESULTS

Present study was undertaken to evaluate the growing apprehension of deteriorating mental health of Medical students in Indian scenario, a problem not discoursed enough in medical students of southern part of India which was done at Deccan Medical College, Hyderabad to evaluate the presence of features. A total of 275 Students were included in the study of which 175 were studying in Final year part-I and 100 in Final year Part-II, 65% were female and 35% were male students. Average age of the student was 20.3 years. We found that prevalence of depression among medical students were 28.72%. Among them 2.18 % had severe depression and 1% extremely severe depression.(Table-2,3) .

Table 1.DASS-21 Classification of Depression, Anxiety and Stress

Grading	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	13-Oct	9-Aug	15-18
Moderate	14-20	14-Oct	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

DISCUSSION

A recent meta-analysis involving 167 cross sectional studies from 43 different countries reported the overall prevalence of depression among medical students was 27.2%.[1]. Another Meta-analysis where 77 different studies were examined demonstrated the global prevalence of depression in medical students of 28%.[9] [7] Discreet studies from India reported prevalence of

58%, 51.3%, 45.4% of depression among Medical students from Kerala, Odisha and Andhra Pradesh much higher than reported by our study [3][8][9], this can be attributed to the wide variation in prevalence of depression reported by different studies all over the world (9% to 56%).[1]

Table 2. Prevalence of Anxiety and stress

Anxiety with respect to DASS-21 Scale	Number of Students	Percentage
Normal	123	44.73%
Mild Anxiety	41	14.91%
Moderate Anxiety	69	25.09%
Severe Anxiety	21	7.64%
Extremely Severe Anxiety	21	7.64%
Stress with respect to DASS-21 Scale	Number of Students	Percentage
Normal	219	79.64%
Mild Stress	33	12.00%
Moderate Stress	16	5.82%
Severe Stress	6	2.18%
Extremely Severe Stress	1	0.36%

Table 3.Distribution of Depression, Anxiety and Stress with respect to Sex

	Females(N=180)	Males(N=95)	Significance
Depression	55(30.56%)	24(25.26%)	Chi=0.85, p=
Anxiety	105(58.33%)	47(49.47%)	Chi=1.97, p=
Stress	33(18.33%)	23(24.21%)	Chi=1.32,p=

Table 4. Distribution of Depression, Anxiety and Stress with respect to Phase of Study.

	Depression		Anxiety		Stress	
	Normal	Abnormal	Normal	Abnormal	Normal	Abnormal
Final yr Part-I(%) (N=175)	116 (66.28)	59 (33.71)	80 (45.71)	95 (54.28)	136 (77.71)	39 (22.28)
Final yr Part-II(%) (N=100)	80 (80)	20 (20)	43 (43)	57 (57)	83 (83)	17 (17)
	Chi= 5.85, P=0.01		Chi=0.19, P=0.66		Chi=1.10, P=0.29	

In our study prevalence of anxiety were 55.27% among them 7.64% had severe and extremely severe anxiety each. (Table 4). Prevalence of stress among were 20.28% among them 2% had severe stress. . A systematic review of 29 studies from North America reported the Prevalence of 7.7-65.5% for anxiety, 12.2-96.7% for psychological

distress.[10] A meta-analysis of 59 studies from Brazilian medical students reports the prevalence of anxiety among 32.9% and stress among 49.9% [11]A discreet study from Nepal reported an overall prevalence of anxiety in 41.1% and stress in 27% of Nepalese medical undergraduates. [12] Indian studies has reported the prevalence of anxiety and stress among 66.9% and 53% [3], 64.9% and 40% [9],50.6% and 32.8% respectively.[13] findings of our study correlates with other studies done in India and elsewhere with respect to prevalence of Anxiety but we have report lower prevalence (20.28%) of stress among students of Deccan medical college Hyderabad indicating better stress management strategies by students like regular sports, peer support and active participation of teachers in student counseling.

Current study found both Depression and Anxiety were more common among females students compare to males but this differences were not statistically significant. There is robust epidemiological and clinical evidence that a greater number of women than men experience depression and anxiety.[14] Recent studies from India also shows higher depression scores in female students and anxiety scores were not significantly different in male and female students.[7][13][15]. Significantly more number of students of final MBBS Part-I were found to have symptoms of depression compare to Part-II, although no such difference were found for Anxiety and stress. Moutinho et al reported marked differences in prevalence of depression and anxiety among medical students from different course semesters. Indian studies showed high prevalence of depression and anxiety among second term students when compared to eight term medical students. As stated by Mandal et al the reasons for stress among second term students may be language problem, vast syllabus, fear of failure, parental and peer pressure, tight schedule, away from home, tough topics, substance abuse etc.[13][16]

Current study was restricted to only final year students from Phase-I and Phase-II and we recorded depression in significantly more number of final year phase-I students compare to the Phase-II Medical students. These findings are contrary to the common perception that final year phase-II students are more prone for mental stress and depression because of extensive syllabus and final exam pressure. Few studies have shown decrease in the occurrence of all the psychosocial disorders like depression anxiety and stress in the students of the Final year both Medical and Engineering. [17]Reasons for such findings in our study and few other studies need to be further explored. Chenganakkattil S et al. studied the comparative prevalence of depression and anxiety in medical and engineering students from India and concluded that both rates of depression and anxiety among medical students are significantly higher compare to engineering college students.[18] Another such comparative study from Bangalore found Anxiety and Stress significantly more common in engineering students where as Depression more common among Medical

students.[17] In general Medical students are reported to have more mental health problems compare to their counterparts in other fields[19].

CONCLUSION: Around one third of the Medical students reported features of Depression and more than half reported features of Anxiety. The reported rates are significantly higher when compared to students of other professional courses. These mental problems among medical students have shown a steep increase in last three decades, of particular disquiet is the rising levels of depression and suicidal ideation among Medical students. Early recognition of vulnerable students like Failures, students with Language problems and learning difficulties, students from low socio-economic strata and their effective counseling at early stages by teachers will go long way in making of confident doctors and confident and proficient medical fraternity. Setting up students counseling centers at medical colleges where students can approach to discuss their difficulties, regular orientation and motivational programmers, change in approach of teaching from inimically authoritative to more benevolent and empathetic are other approaches that need serious considerations.

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Conflict of Interest: None

Source of funding support: Nil

How to cite this article: Sayeedunnisa Sarah, Sultan Rizwan Ahmad, A. Chandrasekhar. Prevalence Of Anxiety And Depression Among Medical Students Of Deccan Medical College, Hyderabad. Nat J Res Community Med 2018;7(3):229-232.

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NJRCM: www.commedjournal.in



ORIGINAL RESEARCH ARTICLE

doi: 10.26727/NJRCM.2018.7.3.233-236

Year: 2018 Vol: 7 Issue: 3. Jul.-Sep. Page: 233-236

Investigation of Diarrhoea Outbreak in a Remote Village of Southern Karnataka

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Date of Submission : 18-07-2018

Date of online Publication : 31-07-2018

Date of Acceptance : 30-07-2018

Date of Print Publication : 31-07-2018

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ABSTRACT

Diarrhoea occurs world-wide and causes 4% of all deaths and 5% of health loss to disability. A total of 1714 outbreaks have been reported in 2017 in India of which acute diarrhoeal diseases is major cause. One of the most important causes for diarrhea is due to water contamination with human and animal feces. The main purpose of an outbreak investigation is to control the outbreak, limit its spread to other areas and assess the preventive strategies that could be adopted to reduce or eliminate the risk of such outbreak in future. Methodology: 18 members in the village of V. Guttahalli were admitted to the community health centre at Mulbagal in Kolar, in November 2010 with vomiting, diarrhoea and severe dehydration. A rapid household survey in the affected village was carried out for case finding and management. Environmental survey was carried out. Drinking water samples were collected and analyzed. Results: Thirty people in the rapidly surveyed households had developed acute diarrhoea in the past 7 days. The affected households were consuming water from common sources. The water supply distribution pipes were tampered near the collection points. Generally sanitation of the community was very poor with open defecation all around and animal dung was present near the water collection points. Cholera bacilli was not identified from stool samples and water collected from water tanks. The outbreak declined after ensuring that people collected water from a single point and temporarily stopping the distribution of water through the multiple water taps in the community. One out of the four water samples from different collection points was positive for E-coli. Conclusions: Water contamination through the damaged distribution pipes was identified as the cause of acute diarrhoea outbreak at V. Guttahalli. It is important for the local governance to supervise and maintain water supply system. The community should be educated about the importance of hygiene and sanitation of water distribution system and the water collection points.

Key-words: Outbreak, Diarrhoea, Risk, Community, Water.

INTRODUCTION

Diarrhoea occurs world-wide and causes 4% of all deaths and 5% of health loss to disability. It is most commonly caused by gastrointestinal infections which kill around 2.2 million people globally each year. ¹A total of 1714 outbreaks have been reported in 2017 in India of which acute diarrhoeal diseases is major cause. ²One of the most important causes for diarrhea is due to water contamination with human and animal feces. The aetiology of diarrhoea is very varied, important aetiological enteropathogens are V. Cholera, E. coli, salmonella, shigella. Rotavirus has emerged as the leading cause of severe, dehydrating diarrhoea in children age less than 5 years. ³Most of the pathogenic organisms that cause diarrhoea are transmitted primarily or exclusively by the faecal-oral route. Faecal-oral transmission may be water-borne; food-borne, or direct transmission which implies an array of other faecal-oral routes such as via fingers, or fomites, or dirt which may be ingested by young children. ⁴An epidemic or outbreak is said to exist when the number of cases is in excess of the expected

frequency for that population, based on the past experience. ⁵The main purpose of an outbreak investigation is to control the outbreak, limit its spread to other areas and assess the preventive strategies that could be adopted to reduce or eliminate the risk of such outbreak in future.

The objective of the investigation was to describe the outbreak of Diarrhoea at V. Guttahalli village in Kolar, to identify the factors contributing to the outbreak and to suggest control measures.

MATERIAL AND METHODS

Soon after getting the reports of increased number of cases of diarrhoea in V. Guttahalli on November 2010, a team comprising of Medical Officer, A.N.M., Asha worker, Lab technician and few M.B.B.S. interns visited the area. The diagnosis of outbreak was confirmed clinically and as the number of cases were clearly in excess of expected frequency for that area and time of the year, it was considered to be an outbreak. The people at

risk were defined. Spot map prepared to find out clustering of cases.

A house to house survey was conducted to find out the cases among all the households of V. Guttahalli Village, Mulbagal Taluk. Along with finding of cases a questionnaire was prepared which would help us in finding out about symptoms of cases if any, treatment seeking behaviour, treatment obtained, storage of water, source of water and method of purification. Testing of ecological factors were done i.e. water sources were examined for cleanliness, the water samples were taken from those sources for laboratory testing and the sewage system were looked into.

The cases which were admitted in the hospital were followed up and stool samples were obtained from them for the laboratory testing. The follow up was done in the village until no new cases were obtained.

Statistical Analysis-

The obtained data was entered in the MS excel sheet. The proportions of the various quantitative and qualitative variables were found. The information from questionnaire survey was entered in Microsoft Excel and later analyzed with SPSS software.

Ethical Clearance: The study received approval by the research review board and the ethical review board of Sri Devaraj Urs Medical College, Kolar. Verbal informed consent was obtained from the participants or their guardians before proceeding with the survey activities. Anonymity of the respondents at all stages of data analysis was maintained.

RESULTS

Table 1 Shows a total of 160 households were investigated for diarrhea outbreak. The total no. of study subjects were 678 among them 51 % are males and 49% are females. Sex wise distribution of cases shows that females (77%) were more affected than males (23%), With respect to the age distribution Predominantly adults(16-65 age group) are affected by gastroenteritis 65% compared to other age group.

Table1: Demographic characteristics of the study population

Study population	Frequency(N)	Percentage(N)
Total no of males	275	51
Total no of Females	265	49
Total	678	100
Gender distribution of cases		
Males	7	23
Females	24	77
Total	31	100
Age distribution of cases		
Age group		
0-5	4	13
15-Jun	5	16
16-65	20	65
>65	2	6
Total	31	100

Figure 1: Epidemic curve of Diarrhoea cases

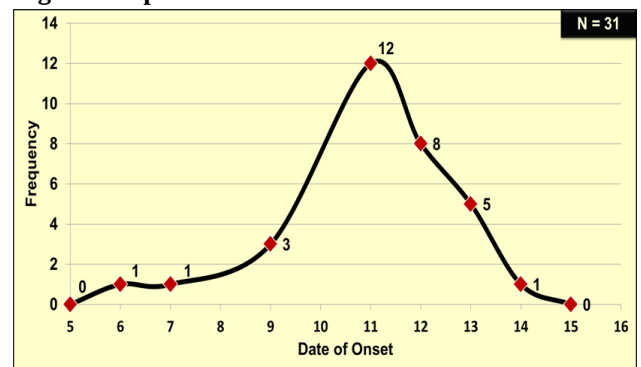


Table 2: Attack rate of the study population

	No. affected	Total no.	Disease specific attack rate (%)
Gender specific attack rate among the study population			
Male	7	371	1.9
Female	24	307	7.8
Total	31	678	4.6
Age specific attack rate among the study population			
0-5	4	72	5.6
15-Jun	5	140	3.6
16-65	20	449	4.4
>65	2	17	11.7
Total	31	678	4.6

Table 3: Clinical features and practices among the study subjects

	Frequency(N)	Percentage(N)
Presentation of symptoms		
Loose stools	29	93.5
Vomiting	4	12.9
Treatment seeking behaviour		
No treatment	2	6
Village level	8	26
Urban level	21	68
Total	31	100
Storage of water		
Buckets with Closed container	153	95.62
Open	7	4.37
Total	160	100
Method of purification		
No method	53	33.12
Boiling	107	66.85
Total	160	100

Fig. 1 shows the epidemic curve of the diarrhoea outbreak at V.Guttahalli Village. Ashwini, a 21-year-old female, was the primary case, reported on November 6th 2010. She complained of severe watery stools and vomiting, for which she was admitted to the Government Hospital, Mulbagal. She did not provide a history of

travel outside the village or eating outside the house in the past month. This report was followed by four cases on November 11th. On 12th, there were 25 reported cases of diarrhea, and a rapid response team was immediately set up in the village. The cases were treated with antibiotics, an oral rehydration solution and intravenous fluids according to the severity of the case in the village itself. Critical cases requiring further care were referred to the Taluk hospital for more intensive treatment.

Table 2 shows the attack rate among the study population is high among females 7.8% compared to males 1.9 % and the attack rate is high among the age more than 65 (11.7 %) compared to the other age group.

Table 3 shows that loose stools and vomiting are the predominant clinical symptoms among the study population. About 68 % of the cases have visited urban area for treatment seeking in a health center, about 26 % of the cases have taken treatment at the village level by seeking the advice of ASHA worker and 6 % of the cases have not taken any treatment. Among the 160 households surveyed about 96 % of the households were storing the water by closing the container. In 67 % of the households boiling was the method employed for purification of water and in 33 % of the households no method was used in purification of water.

Sanitary Survey: Drinking water source for the village is a tube well. Water is stored in a overhead tank which was cleaned once in 5 months. Water from the borewell is pumped into a water tank situated near the school. Everyday water in the morning water is supplied through pipes to the village houses. A leaking valve was identified near the water tank. The water distribution pipe ran through the drainage floor. Many houses in the village use this water for domestic use and drinking. Water is generally stored in pots, vessels and drums, although a few houses use sumps. Water samples collected from all sources were not potable, as the water contained coliform organisms. On the spot map, the whole village was affected, and no clustering of cases was observed. Water distribution pipes are damaged and leaking at four sites. People collect water from stand posts, which distributes water to around 22 houses. Drinking water is stored in closed vessels in most of the houses. 67% of the houses boiled water before drinking. Open field defecation was practiced by many individuals in the village. Out of the 4 samples taken at various water distribution system in the village one sample showed E-coli contamination. Overall Sanitary conditions of the village was very poor. Stool examination of the patients showed growth of E-Coli but no growth of Vibrio cholera was seen.

Interventions done

Village panchayat were informed about the outbreak. The leaking valve on the water distribution pipe running through the drainage floor was replaced, and the location of the pipe was shifted. Overhead water tank cleaned & chlorination was done The local authority was advised to chlorinate the water every morning. All disease cases were educated regarding the use of boiled water and hand washing practices during house visits and treatment.

House to house distribution of chlorine tablets and O.R.S. sachets was done. Overhead water tank cleaned & chlorination was done. Health education was given to the villagers on hygiene, sanitation, using boiled water during outbreak.

DISCUSSION

The diarrhoea outbreak included a total of 31 cases with the attack rate of 4.1, of which the attack rates among the females are high (7.1) compared to males (1.9). The attack rates were highest among the elderly (11.7) followed by children less than 5 years (5.6). Common source single epidemic curve was seen.

In this diarrhea outbreak the attack rates among the females is high (7.8) compared to males (1.9), where as in a study conducted Manoj kumar et al, males and females are almost equally affected.⁶ The females are affected more compared to males due to consumption contaminated water is high among them at the house as males are gone out for work. In a study conducted by S B Patil et al, males are affected more (57.9%) compared to females showing the causative organism exposure at work site for males.⁷

In a study conducted by A Joshi et al, the attack rate among the elderly was high (47.4) similarly in our study also observed high attack rates among the elderly (11.7) when compared to lesser age.⁸

In our study about 95.62 % of the households practiced water storage of in a closed container, similarly in a study conducted by Sonia puri et al, the water storage in a plastic containers and buckets seen to be of 87%.⁹ Our study also shows that piped water supply does not guarantee protection against faeco oral diseases. Proper layout of the pipes along with regular maintenance and repairs are needed to ensure supply of safe and potable water. In this study it was found that irregular and/or inadequate treatment of water, lack of drainage systems and domestic washings near the wells led to deterioration in the quality of water. The WHO water sanitation report shows 80% of the developing world population have access to some type of improved drinking water source and only 44% have access through a household connection from a piped system. In this study the all the household members accessed to improved drinking water but residual effect of chlorination was not met due to negligence in chlorination of the overhead tank in the village was observed. Although Individual household piped water system was not found in the village and only the stand posts were placed in many areas in the village or domestic and drinking purpose.

Conclusion:

Availability of safe and potable drinking water is always a major problem in rural India. Open air defecation and disposal of garbage is commonly practiced in this village. Bore well water was stored in water tank and then tank water was utilized for multiple purposes (washing clothes, cleaning, drinking and cooking etc.) by residents of the village. Outlet of tank is plastic pipe which passes through drainage at various places of the village. There is

high chance of sweeping of drainage water into the water pipe easily and chance of transmission of infection is pretty easier.

Relevance for the study:

As the outbreak happened in a very remote and very poor hygiene conditions of the Village V. Guttahalli which is now improved with respect to the interventions happened may be after the outbreak. At the same time the village now is having purified water system and same water is distributed to all the households. We might expect the same incidence to happen in the neighboring village Ramasagar where the sanitary conditions are very poor. The interventions done in the V. Guttahalli and water purification system by reverse osmosis can help in this village. In places like this still open air defecation and poor hygiene practices the outbreaks can be continued.

Recommendations:

Local concerned authorities should take care of the water sources, cleanliness of the surrounding areas should be maintained. Village people should be educated about the hygiene practices, methods of purification of water, uses of consuming pure water etc.

Acknowledgement: Dr. Ranganath B.G Professor, Department of Community Medicine, Malabar Medical College Hospital and research centre, Calicut, Dr. Achal Shetty Assistant Professor, Department of Community Medicine, Father Muller Medical College, Mangalore, ASHA workers, ANM's and interns of Sri Devaraj Urs Medical College, Kolar.

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Conflict of Interest: None

Source of funding support: Nil

How to cite this article: Naresh Kumar S J, Prasanna Kamath B T, Muninarayana C. Investigation of Diarrhoea Outbreak in a Remote Village of Southern Karnataka. Nat J Res Community Med 2018; 7(3): 233-236.

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NJRCM: www.commedjournal.in



ORIGINAL RESEARCH ARTICLE

doi: 10.26727/NJRCM.2018.7.3.237-241

Year: 2018 Vol: 7 Issue: 3. Jul.-Sep. Page: 237-241

Prevalence of Hypertension and Associated Risk Factors of Hypertension Among School Teachers in Cheyyar Town, Tamilnadu.

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Date of Submission : 18-07-2018

Date of online Publication : 30-07-2018

Date of Acceptance : 30-07-2018

Date of Print Publication : 31-07-2018

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ABSTRACT

Objective: To find out the prevalence of hypertension and assess the various risk factors and determinants of hypertension among school teachers in Cheyyar town. **Material and Methods:** **Study setting:** The present study was a Community Based Cross Sectional study conducted at government and private schools located in Cheyyar town. **Sample size and Sampling:** The required sample size was calculated as 198. The sampling technique used was Simple Random Sampling. **Data collection tool:** A questionnaire was provided to the participants after obtaining informed consent, to record information regarding socio-demographic characteristics and cardiovascular risk factors. Physical activity of the respondents was assessed using The International Physical Activity Questionnaire (IPAQ), with 7 day recall period. Perceived Stress Scale (PSS) was used to measure the level of psychological stress experienced by the respondents. Anthropometric measurements were done and blood pressure was recorded. **Analysis:** The data collected was entered and analyzed using SPSS software package (Version 21). Descriptive statistics and appropriate Tests of significance (Chi-square test) was applied to establish the relation between the study variables. A p value of less than 0.05 was considered to be statistically significant. **Results:** Increasing age, place of residence (indicating travel to workplace), Socioeconomic status, Tobacco use, Alcohol consumption, Increased Body mass index, Decreased physical activity, High levels of Stress were significantly associated with pre-hypertensive & hypertensive states. **Conclusion and recommendations:** There is an urgent need for periodic monitoring and screening programs for hypertension among the teaching faculty. It would serve the dual purpose of self awareness and spread of health awareness to the students by the teachers.

Key-words: Hypertension, Teachers, Physical activity, Perceived Stress

INTRODUCTION

Cardiovascular disease (CVD) is attributed to about one-third of deaths globally, and this number continues to rise in developing and developed countries. Although majority of the risk factors can be controlled, monitored and prevented, there is relative scarcity in its early identification and prevention, especially in developing countries. Individual targeted initiatives are needed for effective control and prevention of cardiovascular diseases and its complications.¹⁻² Hypertension is directly responsible for more than half of all deaths due to cardiovascular disease in India. In Urban India, the prevalence of Hypertension has been reported to have a steady rise over the years from 1.24% in 1949 to 36.4 % in 2003.³ Studies suggest that this rising trend is due to life style changes like addictions (smoking and alcohol abuse), dietary changes, and psychological stress.⁴⁻⁶ Urbanization has led to physical inactivity due to technological advances. The demand for education has also seen a dramatic rise over the years due to urbanization, leading to an increased demand for quality educational institutions, therein increasing the burden of the teachers. The increased workload in turn requires them to do overtime work, improper dietary practices and restricted physical activity along with increasing levels of psychological stress. These factors tend to have a negative impact on the health

of the teaching faculty, making them more prone for diseases like Hypertension and Diabetes mellitus.⁷⁻⁹ The commonly explored occupational health problems of the teachers are voice problems, musculoskeletal disorders, contact dermatitis and psychological stress. The present study is aimed to find the prevalence of hypertension among the teachers and find the role of various determinants of hypertension among the study population in the surrounding area, such as to plan and implement targeted interventions to benefit the study population in the future years.

MATERIAL AND METHODS

Study area: Cheyyar is a town located in Tiruvannamalai District in the Tamil Nadu state of South India.¹⁰ Cheyyar is located at 12.6580°N 79.5424°E on the banks of Cheyyar River in the north-eastern corner of Thiruvannamalai district of Tamil Nadu.

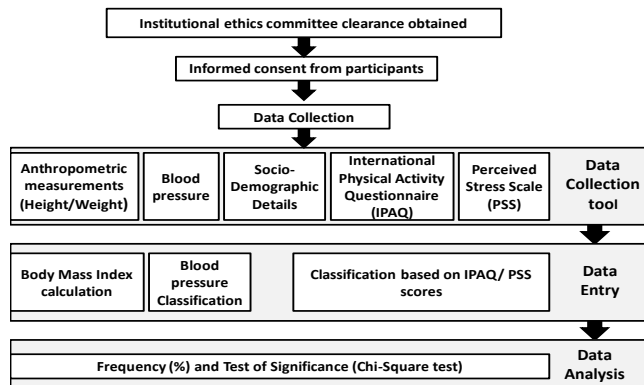
Study Design & Setting: The present study was a Community Based Cross Sectional study, conducted at government and private schools located in Cheyyar. The methodology of the study is depicted in Fig 1.

Study duration: The study was started after approval from the Institutional Ethics Committee of Meenakshi Medical College

Hospital & Research Institute and completed within one and half years. The study was conducted in the year of 2016-2017.

Sample size and Sampling: Considering the prevalence of hypertension and its associated risk factors among School Teachers to be 13.25%, 95% confidence interval, 80% power the minimum sample needed for the study was calculated to be 183. Bearing in mind, factors like refusal to consent / non response, and additional 15 participants were added. The final sample size was taken as 198.¹¹ The sampling technique used was Simple Random Sampling.

Fig 1: Methodology of the study



Data collection Tool: Data collection was done during working hours at a time feasible to the respondents. The study was conducted in the school premises after obtaining prior permissions from the concerned authorities. After obtaining informed consent from the participants, a questionnaire was administered to collect the data. The questionnaire covered information on socio-demographic information, duration of employment, presence of various cardiovascular risk factors like smoking, alcohol, dietary practices. Family history of hypertension, diabetes and coronary heart disease were collected. International Physical Activity Questionnaire (IPAQ) was used to measure physical activity and Psychological stress was measured using Perceived Stress Scale (PSS) among the respondents. Anthropometric measurements like Height, Weight were measured and Body Mass Index was calculated. Blood pressure was measured and recorded for all the participants.

Anthropometric measurements:

Standing weight and height of participants was measured with light clothes and no shoes, using standardized methods. Weight was measured with a conventional bathroom scale and it was approximated to the nearest half kilogram (Kg). The scale was calibrated daily to ensure quality control. The International Physical Activity Questionnaire (IPAQ) was developed as an instrument for measuring of physical activity. The short IPAQ form "last 7 d recall" is recommended for national monitoring and the long form for research requiring more detailed assessment.¹² Perceived Stress Scale (PSS) is the most common assessment scale to assess the level of stress experienced by a person following various stressful events, like physical diseases and psychological disorders. There are three forms of the PSS, the initially developed scale had 14 items (PSS-14), later shorter versions with 10 (PSS-10) and 4 (PSS-4) items had been developed. The perceived stress scale has a recall period of one month. The scale is open access and does not require copyright permissions.¹³ In the present study we used the PSS-4 version.

Statistical Analysis: The data was entered and analyzed by using Statistical Package for Social Sciences (SPSS) (version 21.0) software package. Descriptive statistics was used to define the study population. Categorical and ordinal variables were expressed as frequency/percentages. Continuous variables were expressed as mean and standard deviation. Body Mass Index

(BMI) was then calculated in kg/m^2 by dividing weight (in Kg) by the square of the height (in meters). Based on the calculated body mass index, the participants were classified as being underweight when BMI was less than $<18.5 \text{ kg/m}^2$, normal weight when BMI was between $18.5\text{--}24.9 \text{ kg/m}^2$, overweight and obese I & II when BMI was 25 to 29.99 and $\geq 30 \text{ kg/m}^2$, respectively.¹⁴ After finishing the examination, all diagnosed cases of hypertension, diabetes and obesity among teachers were notified about the problem, given health education, and appropriate referral services were provided. The IPAQ scoring was used to classify the respondents into 3 categories namely inactive, minimally active, and Health Enhancing Physical Activity (HEPA).¹⁵ Perceived stress score was calculated by reverse coding the scores of the 2nd and 3rd questions (Positive indicators), where $4=0, 3=1, 2=2, 1=3$ and $0=4$.¹⁶ Appropriate Tests of significance (Chi-square test) was applied to the study variables to establish the relation between the study variables. A p value of less than 0.05 was considered to be statistically significant.

Ethical issues: Ethical principles such as respect for the persons, beneficence and justice were adhered. Clearance from the Institutional Review Board [9/MMCH&RI/2015(A)] was obtained prior to beginning of the study. Informed consent was obtained from individual participants prior to start of the study. Newly diagnosed respondents, were notified of the condition and proper referral to the concerned specialist was provided. No information was withheld from the respondent.

RESULTS

Socio-demographic Characteristics of the respondents:

Our study showed that, the mean age of the respondents was 38.64 ± 9.33 . Majority (61.8%) of the respondents were aged between 31-50 yrs. Among the total 198 participants, 61 (70.7%) were female and married (80.3%). Majority of the participants were Hindu (92.9 %) and belonged the upper (47.5%) and upper middle class (44.9%). Majority (93.4%) of the study participants were from outstation, requiring daily commute to the teaching institution.

The mean years of experience of the respondents was 11.79 ± 9.014 . More than half of the respondents had an experience of 10 years or less (54.5%). In our study, the participants teaching various classes were of almost equally distributed between primary (33.3%), secondary (33.8%) and higher secondary (32.8%).

Cardio vascular risk factors:

Cardio vascular risk factors reported by the respondents were as follows, majority were Non-smoker (89.9%), Non- Alcoholic (86.9%), and had a mixed dietary pattern (73.2%). More than half the respondents reported to not having a Family history of Hypertension (64.1%), Diabetes mellitus (61.1%) and Coronary Heart Disease (82.3%). Majority of the respondents had no History of Hypertension (86.9%) and Diabetes mellitus (85.9%). (Table 1)

Anthropometric measurements, Body Mass Index, Physical Activity & Perceived Stress Scores of the respondents

As seen in table 2, the Mean height of the respondents was 158.06 ± 7.946 and Mean weight was 64.57 ± 12.378 . Based on the calculated Body Mass Index, most of the respondents were classified (40.9%) and Over weight (35.4%). Majority of the respondents were found to be Physical Activity Inactive (63.1%), while the Perceived Stress Scores among respondents showed that more than half the respondents had Moderate stress (62.1%) while 28.3% of the respondents were found to have low stress.

Table 1. Cardio vascular risk factors among the respondents (n=198)

Variable	Frequency	Percentage
Smoking distribution		
Smoker	17	8.6
Non-smoker	178	89.9
Ex-smoker	3	1.5
Alcoholism distribution		
Alcoholic	18	9.1
Non- Alcoholic	172	86.9
Ex- Alcoholic	8	4
Dietary practices		
Vegetarian	53	26.8
Mixed	145	73.2
Family history of Hypertension		
Yes	71	35.9
No	127	64.1
Family history of Diabetes mellitus		
Yes	77	38.9
No	121	61.1
Family history of Coronary Heart Disease		
Yes	35	17.7
No	163	82.3
History of Hypertension		
Yes	26	13.1
No	172	86.9
History of Diabetes mellitus		
Yes	28	14.1
No	170	85.9
JNC 7 classification		
Normal Blood pressure	95	48
Pre-Hypertension	72	36.4
Stage I Hypertension	26	13.1
Stage II Hypertension	5	2.5

As seen in Table 3, variables like Age, Classes taught by the teachers, years of experience, place of Residence, Socioeconomic status, Tobacco use, Alcohol consumption, Diet, Body mass index, International Physical Activity Quest Scores, Perceived Stress Scale Scores were correlated with stages of hypertension. Significant association was found with all variables in the development of pre-hypertension. Increasing Age, place of Residence indicating travel to workplace, Socioeconomic status, Tobacco use, Alcohol consumption, increased Body mass index, decreased physical activity, high levels of Stress were significantly associated with the development of Stage I hypertension. Stage II hypertension was found to be associated with Increasing Age, mixed diet, increased Body mass index, increased physical inactivity and increased psychological stress

DISCUSSION

Our results showed, The mean age of the respondents was 38.64 ± 9.33 . More than half of the respondents were aged less than 50 years. Majority of the study participants were female, **Table**

2 Anthropometric measurements, Body Mass Index, Physical Activity & Perceived Stress Scores of the respondents (n=198)

	Frequency (n=198)	Percent
Body Mass Index of respondents		
Under weight	10	5.1
Normal	81	40.9
Over weight	70	35.4
Obesity I	34	17.2
Obesity II	3	1.5
International Physical Activity Questionnaire Scores		
Inactive	125	63.1
Minimally active	45	22.7
Health enhancing physical activity	28	14.1
Perceived Stress Scores among respondents		
Low stress	56	28.3
Moderate stress	123	62.1
High perceived stress	19	9.6

Table 4 Correlation between various Risk factors and Stages of Hypertension

	Pre-Hypertension n=72 (χ^2 , df, p value)	Stage I Hypertension n=26 (χ^2 , df, p value)	Stage II Hypertension n=5 (χ^2 , df, p value)
Age	9.89, 3, 0.01*	21.253, 3, 0.01*	6.14, 3, 0.04*
Teaching class	9.75, 2, 0.008*	0.53, 2, 0.82	0.20, 1, 0.65
Years of experience	36.33, 3, 0.001*	5.077, 3, 0.16	0.20, 1, 0.65
Residence	76.05, 1, 0.01*	43.56, 1, 0.010*	-
Socioeconomic status	30.58, 2, 0.001*	19.84, 3, 0.001*	0.4, 2, 0.81
Tobacco use	91.58, 2, 0.001*	40.69, 2, 0.001*	-
Alcohol	95.58, 2, 0.001*	7.53, 1, 0.008*	1.80, 1, 0.18
Diet	18.0, 1, 0.001*	3.84, 1, 0.05	0.20, 1, 0.65
BMI	61.36, 4, 0.001*	9.88, 3, 0.02*	6.72, 2, 0.01*
IPAQ Scores	39.93, 2, 0.001*	31.58, 2, 0.001*	15.07, 2, 0.001*
PSS Scores	39.81, 2, 0.001*	39.08, 2, 0.001*	9.30, 2, 0.01*

Hindus and married. Most of the study participants had to travel from outstation to reach their workplace. More than 80% of the respondents belonged to the upper and upper middle classes. Majority of the teachers had an experience of less than 30 years.

In this study we found that most of the respondents were non-smokers and non-alcoholics, more than 70% of the respondents consumed a mixed diet. the distribution of overweight, obesity I & obesity II were 35.4 %, 17.2% & 1.5 % respectively. Our results show that more than 60% of the respondents were physically inactive. The respondents with moderate and high perceived stress were 62.1% and 9.6% respectively. Our results showed the prevalence of pre hypertension to be 36.4% and the prevalence of hypertension to be 15.6%.

Socio-demographic Characteristics: In our study the mean age of the respondents was 38.64 ± 9.33 years.. Similar results were reported by Ibrahim et al (36.52 ± 7.62)¹⁷, Fikadu et al (36.03 ± 11.91)¹⁸ and Girish et al (32.87 ± 9.19 years).¹⁹ Majority of the respondents were married (83.7%), which is also similar to our study (80%). However in our study most of the teachers were female as compared to their results which had more male respondents as compared to female respondents (1.5:1 ratio).¹⁷ This could be attributed to the better literacy rates among the female population in Tamilnadu and the gender dynamics in the Indian sub-continent. Fikadu et al showed that majority of the respondents (54.1%) were in the middle income category,¹⁸ In our study we found that More than 80% of the respondents belonged to the upper and upper middle classes.

Prevalence of hypertension: Studies from Jeddah¹⁷ and Ethiopia¹⁸ reported prevalence of hypertension among teachers to be 25.2% and 21% respectively. Studies from Tumkur¹⁹ (28.57%) and Bangalore²⁰ (36%) also reported similar findings. Our study reported the prevalence of hypertension to be 15.6%. Our results were lower when compared to the fore mentioned studies, but found to be slightly higher than the Prevalence among secondary school teachers in Belghavi (13.25%).²⁰ The cause of these variations need to be explored further to plan a targeted interventional plan, This can be possible in a multi-centric study involving teachers from different parts of the country.

Prevalence of Prehypertension: Our results showed the prevalence of pre hypertension to be 36.4%, Among school teachers in Jeddah¹⁷ and Bangalore ²⁰ the prevalence of pre-hypertension was found to be 43.0%.and 30% respectively. All studies indicate that prehypertension is on the rise among teachers. This population if not properly monitored and screened on a regular period, would add to the increasing burden of hypertension and its associated complications on the community. This also mandates the planning and implementation of specified interventional programs to address the health needs of the teachers.

Risk factors of hypertension:

Age & Gender: Ibrahim et al reported that that male gender, increasing age, were significantly associated with the prevalence of hypertension, Similar findings were reported by other studies also,¹⁷⁻¹⁸ . Our results are also in line with similar findings, were increasing age is significantly associated with the development of prehypertension and hypertension.

Place Of Residence Indicating Travel To Workplace Our results showed that participants who travelled from outstation to reach the workplace were at a significant risk of developing hypertension, similar findings were reported by Manjula et al. They found that one of the major stress factors experienced by the teachers was due to travel.²¹ The role of travel could be the distance travelled by the teachers, duration of travel and mode of transportation used etc. These factors need to be explored further by future studies.

Tobacco Use & Alcohol Consumption: Studies indicate a strong association between tobacco use and alcohol consumption to the development of hypertension,¹⁷⁻²¹ Our study also presents the same findings, were Tobacco Use, and Alcohol Consumption

were significantly associated with the development of prehypertension and stage I hypertension.

Body mass index & Physical Activity:: Studies have reported that increased body weight and increased body mass index significantly increased the odds of developing hypertension and pre-hypertension among school teachers.¹⁷⁻²¹

Our study also concurs with the other studies by showing the significant association between the variables. The increased BMI among the teachers can be attributed to the inactive lifestyle as seen by the IPAQ scores which shows that majority of the where either inactive (63.1%) or minimally active (22.7%). This could be due to the working hours, nature of work and time lost to travel. These issues can be addressed by organizing sporting events or physical activity session for teachers like yoga in the campus for the benefit of the teachers.

Psychological Stress: Psychological stress has been found to be a significant indicator for the development of hypertension. Our results showed that majority of the teachers experienced moderate level (62.1%) of psychological stress, while 9.6% experienced high levels of stress. Manjula et al reported that the stress factors experienced by the teachers included travel, inadequate salary, experience and discrimination at work.²¹ In our study, we were not able to ascertain the cause of the psychological stress which remains to be a limitation of our study

Conclusion & Recommendations: Increasing age, place of residence (indicating travel to workplace), Socioeconomic status, Tobacco use, Alcohol consumption, Increased body mass index, Decreased physical activity, High levels of Stress were significantly associated with pre-hypertensive & hypertensive states. There is an urgent need for periodic monitoring and screening programs for hypertension among the teaching faculty, to address the growing burden of hypertension. Various programs like yoga meditation and recreational events have to be organized to ease the physical and mental stress encountered by the school teachers. Awareness about the various life style modification like smoking, tobacco usage, alcohol consumption, salt restriction and dietary practices should be imparted to the teachers as it would serve the dual purpose, that of self-awareness and spread of health awareness to the students by the teachers. Teachers can be used as a medium for spreading these messages to their family, the students and their colleagues. Physical activity in the form of games should be organized on a regular basis at the campus, to promote the development of a healthy lifestyle.

In the policy making levels, there is an urgent need to address the growing burden of hypertension. This can be achieved by increasing public awareness regarding healthy behaviors, early detection and prompt treatment of hypertension. A need based population strategy, which is cost-effective and feasible should be devised to address these issues.

Acknowledgement: The authors wish to thank all the teachers and school administrators for being a part of the study.

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Conflict of Interest: None

Source of funding support: Nil

How to cite this article: Jayakumar Anbalagan, Thirunavukarasu MR, Rajkumar R. Prevalence of Hypertension and Associated Risk Factors of Hypertension Among School Teachers in Cheyyar Town, Tamilnadu. *Nat J Res Community Med* 2018;7(3):237-241.

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