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SHORT ARTICLE

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Perceptions on Pulmonary Tuberculosis among DOTS Patients: A Quantitative Study

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ABSTRACT

Introduction: Knowledge and stigma with respect to tuberculosis plays a profound role in the health seeking behaviour of the population. The present study aimed to assess knowledge and stigma regarding the disease among pulmonary tuberculosis patients in a metropolitan city and to study their association with delays in seeking care and treatment. **Materials and Methods:** A cross sectional study was conducted among newly diagnosed pulmonary tuberculosis patients registered for intensive phase of Category 1 ATT during the study period in Zone VIII of Chennai Corporation. The sample size was 197. A standardised WHO interview schedule was adapted and used for the study. **Results:** The proportion of population knowing basic facts about tuberculosis ranged from 100 % (that the disease is curable) to 61.4% (that it is contagious). Women had significantly higher levels of stigma than men. There was no significant difference in knowledge between those who seek care earlier and those who delay seeking care. **Conclusion:** The present study demonstrates the gaps in knowledge regarding tuberculosis. A concerted effort starting from the grassroots level needs to be employed to improve knowledge and dispel myths.

Key-words: tuberculosis, knowledge, stigma, delays

INTRODUCTION

Despite being a preventable and curable health problem, tuberculosis is one of the top 10 causes of death worldwide. India accounts for 20-25% of the global burden of tuberculosis with respect to prevalence, incidence and mortality. The situation is further aggravated by its association with multidrug resistance, HIV/AIDS, Diabetes mellitus, prevalence in the paediatric age group, smoking, malnutrition and other immune-compromised states.¹

Around 25% of the world's population and an even higher proportion of Indian population have latent tuberculosis. People infected with *Mycobacterium tuberculosis* have a 5-15% lifetime risk of falling ill with the disease. Furthermore people with active tuberculosis can infect 10-15 other people through close contact over a course of a year.

In view of the infectivity of untreated cases, it has been recognised that the most effective intervention is early case detection with prompt management to decrease infectivity and the risk of exposure. One of the major factors which impairs these interventions is the lack of knowledge and abundance of stigma surrounding the disease. Tuberculosis was and is viewed as a 'dirty disease', often associated by the general public with factors which themselves create stigma: HIV, poverty, drug and alcohol misuse, homelessness, refugee status,

overcrowding. Furthermore women in India are more vulnerable to such lack of information because of various socio-cultural problems. These cause a delay in seeking care and poorer treatment outcomes, feeding the myth that tuberculosis is not curable. The treatment for tuberculosis is relatively long and arduous, which further complicates the situation. The vicious cycle is perpetuated and strengthened by local traditions and beliefs.

The present study was conducted in one particular zone within the Chennai Corporation. It aimed at assessing knowledge and stigma regarding the disease and how they influence delay in seeking care. Very few similar studies have been conducted previously.

MATERIAL AND METHODS

A cross sectional study was conducted from September 2015 to August 2016 among newly diagnosed pulmonary tuberculosis patients registered for intensive phase of Category 1 ATT during the study period in Zone VIII of Chennai Corporation. Only patients above 18 years of age were included. Those with HIV/TB co-infection were excluded since they were being screened for chest symptoms during their visits to the ART clinics.

Approval was obtained from the Institutional Ethics Committee. Necessary permissions were procured from

Corporation of Chennai and the Medical Officers for TB control.

Sample Size: Studies have shown that around 69.4% of the patients were not diagnosed at their first point of contact with a health facility². Hence P is taken as 69.4% with 5% alpha error and relative precision (E) of 10%, the sample size was calculated to be 177. Assuming a non-response rate of 10%, the corrected sample size was 197.

Sampling Technique: Around 20 patients were being registered every month at the three Tuberculosis Units of Zone VIII. The Tuberculosis Units were visited by the investigator, to enroll relevant patients who satisfy the inclusion criteria. Patients were interviewed when they came for DOTS packages to their respective centres, after obtained informed consent. The procedure was continued till the desired sample size was reached.

Study Tool: A standardised WHO interview schedule adapted from a study in the Eastern Mediterranean region³ was used for this study. It was translated into the vernacular language, with the help of an expert on Tuberculosis and a language professor. It was then back translated and compared. A pilot test was conducted to check for discrepancies and modified.

Statistical Analysis:

The collected data was entered in Microsoft Excel and analysed using the Statistical Package for Social Sciences trial v.22.

RESULTS

A total of 197 patients were interviewed. The socio-demographic profile of the study population is given in table 1a and 1b.

Table 1a – Socio-demographic profile of the study population

Characteristics	Mean ± SD, n(%)
Age (yrs)	43.23±12.52
Gender	
Men	122(61.9)
Women	75(38.1)
Education	
College/higher secondary	74(37.6)
Primary/middle/high school	87(44.2)
Illiterate	36(18.3)
Occupation	
Skilled	32(16.2)
Semi-skilled	74(37.6)
Student	36(18.3)
Unemployed/home maker	8(4.1)

The mean age was 43.52 years with a range of 18 to 70 years. Roughly 62% of them were men. Most of the population were educated (82%) and married (82%). Nearly all (96%) were employed.

Table 1b. Socio-demographic profile of the study population

Characteristics	Mean ± SD, n(%)
Socio-economic status	
Upper middle	59(29.9)
Lower middle	91(46.2)
Upper lower	31(15.7)
Lower	16(8.1)
Marital status	
Married	161(81.7)
Single	16(8.1)
Divorced/separated	8(4.1)
Widowed	12(6.1)
Residence	
Urban	142(72.1)
Urban slum	55(27.9)

The following table (table 2) summarises the proportion of patients correctly responding on knowledge regarding tuberculosis. When compared across gender, it was observed that there is no significant difference between males and females on knowledge about tuberculosis. It is to be noted that all patients were aware about tuberculosis being a curable disease. Only 61.4% of the respondents knew that the disease is contagious and 70% knew the correct duration of anti-tuberculosis treatment. 81.2% knew the nature of their affliction and more than 92% knew that tuberculosis was not hereditary.

Table 2 - Patients' knowledge about tuberculosis across genders (Table 3)

Questions	Men	Women	Chi square	df	P value
What kind of a disease do you have?	103 (64.4)	57 (35.6)	2.162	1	0.141
Is TB hereditary?	115 (63.2)	67 (36.8)	1.604	1	0.21
Is TB contagious?	77 (63.6)	44 (36.4)	0.388	1	0.533
Duration of Anti-Tuberculosis Treatment?	101 (73.2)	37 (26.8)	24.77	1	<0.01

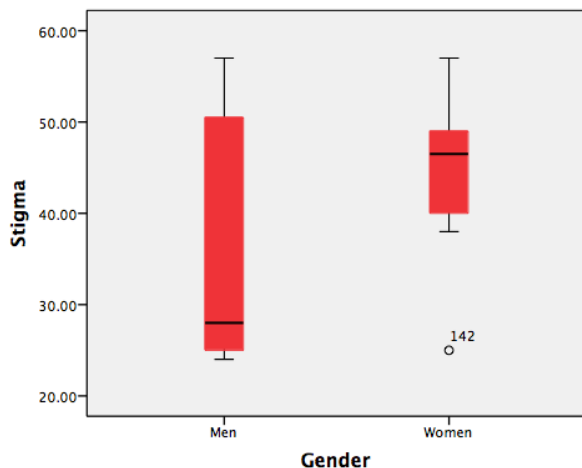
Table 3. Source of information on tuberculosis

Source	n(%)
Govt. campaigns/media	38(19.3)
Educational institutions	24(12.2)
Friends/relatives	64(32.5)
Tuberculosis patients	24(12.2)

Stigma regarding tuberculosis was determined with respect to the following aspects: feeling ashamed of having tuberculosis, having to hide the diagnosis from others, the extent to which the disease affects their work performance, family life and relations with others, whether a girl is unable to decide to get treated for tuberculosis etcetera. The mean scores on stigma were compared across genders using independent samples t-

test. It was observed that women have a significantly higher levels of stigma than men.

Figure 1 – Stigma scores about tuberculosis compared across genders

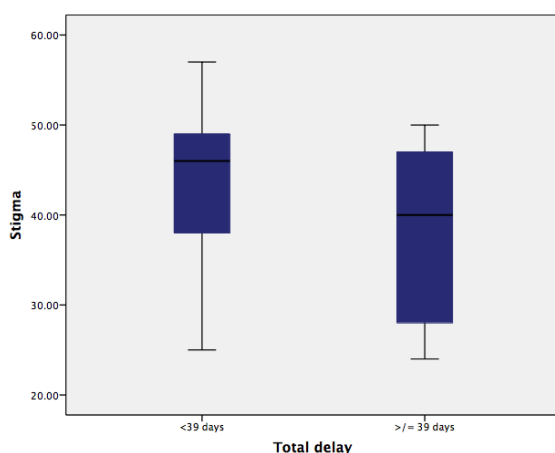


It was observed that the mean delay from onset of symptoms to the start of treatment was 46.72 days (with a median of 39 days). The major chunk of this delay was the mean time taken for the patient to come into contact with the health system, which was around 42 days. For bivariate analysis, total delay was classified according to median cut-off as <39 days (longer delay) and ≥39 days. The knowledge about tuberculosis was compared across the two categories of delay using chi-square test. Overall, there is not much difference in knowledge between those who seek care soon and those who delay seeking care.

Table 4. Knowledge and delay

Questions	<39 days	≥39 days	Chi square statistic	df	p value
What kind of a disease do you have	84 (52.5)	76 (47.5)	6.24	1	<0.01*
Is TB hereditary?	85 (46.7)	97 (53.3)	2.21	1	0.14
Is TB contagious?	56 (46.3)	65 (53.7)	0.474	1	0.49
Duration of anti-tuberculous treatment	60 (43.5)	78 (56.5)	4.155	1	0.04*

Figure 2 – Stigma scores compared with total delay



Similarly, the mean scores on stigma were compared across the two categories of delay. Though the level of stigma among those with prolonged delay seems to be lower, the statistical significance is close to 0.05.

DISCUSSION

It was found that women had a higher level of stigma than men. This is in contrast to the WHO 2006 study³, where women had a higher correct knowledge of tuberculosis than men. There was no significant difference across genders on knowledge regarding tuberculosis. It is notable that all the study participants understood tuberculosis to be a curable disease. In contrast, only 61.4% of them knew that tuberculosis is contagious and 70% knew the correct duration of anti-tuberculous treatment. In contrast, Zhang et al found that only 40% of their respondents knew that tuberculosis is transmitted by close interaction with an affected patient.⁴

The association between stigma levels and delay in seeking care was not significant, as opposed to studies by Mesfin et al, Biya et al and Osei et al^{5,6,7}. Similarly the present study did not find a significant association between knowledge about the disease and delay, unlike some other studies^{5,7,8}.

Conclusion

Although it is satisfying to find all participants knowing that tuberculosis is curable, the gaps in knowledge with respect to contagiousness, treatment duration etcetera need to be rectified. The stigma attached to the disease together with the lack of basic knowledge adds to the vicious web of events which lead to delay in seeking care and treatment. This compromises the very core strategies of tuberculosis control, which are early diagnosis and prompt treatment. Therefore more aggressive campaigns to educate the patients on at least the basic facts of the disease need to be launched, starting from the grassroots level of the primary healthcare providers.

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Declarations

Ethical approval: Approved by Institutional Ethics Committee in Government Kilpauk Medical College, Chennai, India

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Long-term outcome of tuberculosis treatment among patients registered at a tuberculosis unit in Bangalore.

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ABSTRACT

Introduction: Tuberculosis remains one of the world's deadliest communicable diseases and a major public health problem. There are very limited studies to evaluate the long term treatment outcome after the completion of treatment hence this study was undertaken with following objectives. **Objectives:** To assess the treatment outcome after 2 years of treatment completion under DOTS. **Methods:** This was a prospective study done between March 2014 and November 2017. A total of 80 Tuberculosis patients registered for treatment at the Tuberculosis unit in the urban field practice area of medical college between March 2014 to June 2014 meeting the inclusion & exclusion criteria formed the study subjects. Treatment Outcome was assessed at the end of the treatment completion & after 2 years by telephone calls and house visits based on feasibility. The assessment of effectiveness of DOTS therapy in curing the disease, preventing spread of disease among family members & preventing the relapses was done. **Results:** Of the 80 subjects who enrolled to the study 69(86.25%) subjects had treatment success. Of the 69 subjects 30(43.47%) subjects couldn't be traced. 36(52.17%) patients were successfully contacted & 3(4.35%) subjects had died after having treatment success. Only 1(1.44%) of the study subject had relapse of Tuberculosis & currently was on treatment. None of the family members of the study subjects had suffered from Tuberculosis till date after the treatment initiation. **Conclusion:** Anti Tubercular therapy under DOTS is effective in curing disease, preventing the spread of the disease & Preventing relapse of the disease.

Key-words: Tuberculosis, Follow up, Treatment outcome, DOTS

INTRODUCTION

Tuberculosis (TB) has existed for millennia and remains a major global health problem. It causes ill-health for approximately 10 million people each year and is one of the top ten causes of death worldwide. For the past 5 years, it has been the leading cause of death from a single infectious agent, ranking above HIV/AIDS. This is despite the fact that, with a timely diagnosis and correct treatment, most people who develop TB disease can be cured.¹

TB is the ninth leading cause of death worldwide and the leading cause from a single infectious agent, ranking above HIV/AIDS. In 2016, there were an estimated 1.3 million TB deaths among HIV-negative people (down from 1.7 million in 2000) and an additional 3,74,000 deaths among HIV-positive people.¹

The situation in India is no better as India accounts for one fourth of the global TB burden. India has highest burden of both TB and MDR TB. An estimated 1.3 lakh incident multi-drug resistant TB patients emerge annually in India which includes 79,000 MDR-TB Patient estimates among notified pulmonary cases. India bears second highest number of estimated HIV associated TB in the world. An estimated 1.1 lakh HIV associated TB

occurred in 2015 and 37,000 estimated number of patients died among them.²

The Revised National Tuberculosis Control Program (RNTCP), based on the internationally recommended directly observed treatment short-course (DOTS) strategy was launched in 1997 expanded across the country in a phased manner showed remarkable progress with the entire country being covered under the RNTCP. Despite encouraging results and high cure rates achieved in RNTCP, queries are often raised by clinicians regarding effectiveness of RNTCP regimens, particularly the dosage recommended and the intermittent drug administration. These concerns could be convincingly addressed through an assessment of treatment outcome. The health status of TB patients years after course of DOTS treatment was unknown.³

Subsequently in the year March 2016 RNTCP revised its technical & operational guidelines with one of the recommendation as long term follow up of Tuberculosis patients up to two years post treatment completion.⁴

Also very few studies exist till date which have done the assessment of efficacy of DOTS after two years of completion of therapy. Hence in this regard this study was

taken up to know the patient status after two years of treatment completion.

MATERIAL & METHODS

This was a part of prospective study done between March 2014 to November 2017. A total of 80 Tuberculosis patients registered for treatment at the study site between March 2014 and June 2014 meeting the inclusion criteria were included.

The inclusion criteria i.e subjects aged more than 18 years, subjects receiving DOTS regimen, subjects who consented the study were included as study subjects. Exclusion criteria included subjects suffering/detected subsequently with drug resistant tuberculosis and subjects under treatment with local DOTS providers were excluded from the study. The subjects included patients suffering from either pulmonary & extra pulmonary Tuberculosis and taking either Category I & Category II DOTS therapy. This study was conducted at a Tuberculosis unit in the urban field practice area of our medical college which largely houses people from lower socioeconomic status. Outcome of the treatment was assessed at the end of the treatment completion which happened to be June 2015 when the last subject completed the treatment based on the latest WHO outcome definitions published in the year 2013. The same was published in the year 2017.^{5,6}

Now after a span of 2 years i.e. in December 2017 we tried to follow up these patients with an objective to assess treatment outcome after 2 years of treatment completion under DOTS by telephonic calls & house visits which ever was feasible to assess the effectiveness of DOTS therapy in curing the disease & preventing the relapses. The respondent whoever was available during the phone call or the adult respondent present at the time of household visit was asked for the history of suffering TB in any of the household members after the subject suffering from tuberculosis had treatment success. The same respondent was also asked if the subject having treatment success had subsequently developed tuberculosis after the treatment success. The entire data collection was purely based on the history & no examination was done.

The subjects who were successfully traced were assessed for the current status as currently alive, having relapse of Tuberculosis, died and whether any of the subjects had developed drug resistant Tuberculosis.

Data was entered in Microsoft excel & analysed using SPSS (STATISTICAL PACKAGE FOR SOCIAL SCIENCES) version 16. Descriptive statistics such as mean, standard deviation, percentages were used.

RESULTS

The present study included 80 subjects with 51(63.75%) males and 29(36.25%) females. The mean age & standard deviation of the study subjects was 37.8 + 14.2 years. Majority of the study subjects 27(33.75%) were employed in unskilled type of occupation. The socio-economic status of most of the subjects was upper lower class

according to Modified Kuppaswamy classification with updated income ranges for the year 2013. In the present, 70 of the study subjects had taken category I DOTS therapy; among them 40(57.14%) were cases of pulmonary tuberculosis and 30(42.86%) were extra pulmonary tuberculosis. Similarly, 10 subjects were on category II therapy, among whom, 9(90%) were cases of pulmonary tuberculosis and rest 1(10%) were extra pulmonary tuberculosis.

Table 1: Distribution of the study subjects based on Treatment outcome assessed at treatment completion.

Treatment outcome	Category I (n = 70)	Category II (n = 10)	Total (n = 80)
Cured*	29(41.43)	5(50)	34(42.50%)
Treatment completed**	33(47.14)	2(20)	35(43.75%)
Treatment Failed	1(1.43)	1(10) †	2(2.50%)
Lost to follow up	2(2.86)	-	2(2.50%)
Died	3(4.29)	2(20)	5(6.25%)
Not evaluated	2(2.86)	-	2(2.50%)

*Applicable only for Pulmonary smear positive Tuberculosis

‡ Figures in parenthesis indicate percentage

† Subject turned out to be suffering from MDR-TB

**Applicable for extra pulmonary tuberculosis & smear negative pulmonary tuberculosis

Table 2: Distribution of study subjects based on the comorbidities they are suffering.

COMORBIDITIES *	NUMBER (n = 38)
DIABETES	13(16.25)
HYPERTENSION	04(05.00)
COPD	18(22.50)
ANEMIA	45(56.25)
OTHERS**	09(11.25)
HIV STATUS	06 (7.50)

* Total people suffering co morbidities are less than the individual co morbidities suffered, as few patients suffered multiple co morbidities.

**Others included Gout 1, Thyroid disorders 5 & Coronary Artery Disease 1, Epilepsy 1, & Carcinoma 1.

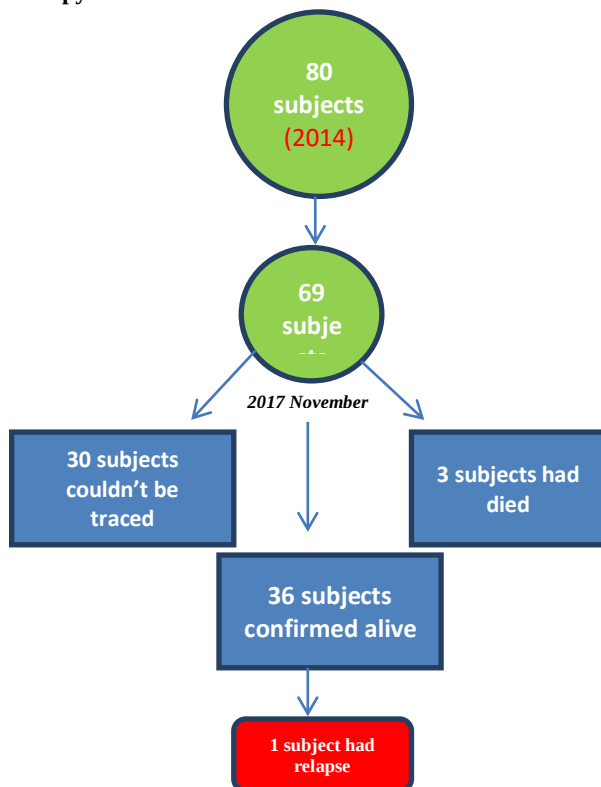
‡ Figures in in parenthesis indicate percentage

The present study showed that, 38 (47.50%) of the study subjects had one or the other comorbidities with chronic obstructive pulmonary disease being the most common comorbidity followed by Diabetes 13(16.25%)(Table 2) Of the 80 subjects 5(6.25%) subjects expired by November 2015, 2(2.5%) subjects were lost for follow up & 2(2.5%) subjects were not evaluated. Also 2(2.5%) of the subjects had failure of treatment and subsequently 1 patient was found to be suffering from Multi Drug Resistant Tuberculosis. So only 69(86.25%) subjects had treatment success. (Table 1)

Of the 69 subjects 30(43.47%) subjects couldn't be traced either because they had moved out of their address which they had registered at the time of treatment initiation or change in the telephone number. Thus only 36(52.17%) patients were successfully contacted & 3(4.35%) subjects had died after having treatment success the cause of death based on verbal autopsy was due to Tuberculosis in

subject as they had relapse of the disease but they couldn't produce any documentary evidence that the cause of Death was due to Tuberculosis & rest of the two subjects the cause of death couldn't be ascertained. Only 1(1.44%) of the study subject had relapse of Tuberculosis & currently was on Anti Tubercular Therapy. (Figure 1)

Figure 1: Summary of long term outcome of Tubercular therapy.



None of the family members of the Tuberculosis had suffered from Tuberculosis till date after the study subjects were initiated on Anti Tubercular Therapy (ATT).

To conclude Anti Tubercular therapy administered under DOTS is effective in curing disease, preventing the spread of the disease & preventing relapse of the disease. Long term follow up should be recommended to all the patients on Anti-tubercular therapy.

DISCUSSION

The present study was carried out to assess the status of Tuberculosis patients two years after the treatment completion. 30(43.47%) of the study subjects couldn't be traced which may be due to migration or change in telephone number which was much higher compared to a studies done at Lucknow(36.4%), Delhi (25.8%) & Mumbai(10.7%).^{7,8,9} Of the 36 subjects who were traced 35(97.2%) of the subjects had no symptoms of TB in contrary the study done at Lucknow stated 91.3% of study subjects were symptom free.⁷ Mortality rate at the end of two years in the present study was 3(7.7%) which was more or less the same as seen in the study conducted at Lucknow where it was 6.3%.⁷ Only 1(2.6%) subject had relapse of Tuberculosis which is similar to the observation made in a study conducted at Lucknow.⁷

In conclusion, RNTCP is effective as revealed by the two year of follow-up results. However, multicentric studies

in larger samples are required for a national evaluation of the programme.

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Pattern of Drinking, Dependence and Morbidity among Male Alcohol Consumers in a Coastal Area of South India.

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ABSTRACT

Background: Alcohol consumption causes around 2.5 million deaths each year globally. Almost 4% of all deaths worldwide are attributed to alcohol consumption. **Objectives:** To measure the prevalence of alcohol consumption among adult males and to determine the pattern of drinking, prevalence of dependence and morbidity among alcohol consumers. **Materials and Methods:** Study design-Cross sectional study. Study area- Kalapet, a coastal area in South India. Sample size- 500. Sampling method- Systematic random sampling. Study population- Adult males aged above 18 years. Data collection- Done by house to house survey using predesigned and pretested questionnaire. Ethical considerations- Approved by PIMS institutional ethical committee. A written informed consent was taken from each study participant before data collection. **Results:** Prevalence of alcohol consumption was 59.6%. Among alcohol consumers around 27.5% (82) reported that they consume alcohol 2-3 days in a week and 26.5% (79) reported daily consumption. More than half (53.1%) of the alcohol consumers were heavy drinkers. Around 18.1% of alcohol consumers had hepatomegaly and 9.1% had hepato-splenomegaly. Prevalence of alcohol dependence syndrome was found as 17.7% among 298 alcohol consumers. **Conclusion:** Prevalence of heavy drinking and alcohol dependence was found to be high among alcohol consumers. Community based screening programme for identification of alcohol dependence and alcohol related morbidity should be developed.

Key-words: Alcohol, dependence, morbidity, coastal area.

INTRODUCTION

Alcohol is the common name given to organic compounds having hydroxyl group linked to a carbon atom. In everyday life alcohol refers to any beverage containing ethanol or ethyl alcohol. Alcohol is one of the oldest known drink the usage of which dates back to 7000 B.C. Due to globalization and innovative marketing techniques the prevalence of alcohol consumption had increased in the last decade to a great extent. Manufacturers are targeting particularly young people so that they can be lifelong consumers. Such long term alcohol consumption will affect almost all visceral organs such as liver, kidney, heart and gastrointestinal tract. The major chronic diseases associated with hazardous drinking are alcoholic liver disease, diabetes mellitus, hypertension, cardiovascular disease, stroke, GIT cancers and alcohol dependence syndrome. Globally harmful use of alcohol results around 2.5 million deaths each year. Almost 4% of all deaths worldwide are attributed to alcohol which is greater than deaths caused by AIDS, tuberculosis or violence.¹ More than half of these deaths occur from NCDs including cancers, cardiovascular disease and liver cirrhosis. While adult per capita consumption is highest in high income countries and nearly as high as in the upper-middle-income countries. An estimated 4.5% of the global burden of disease – as

measured in DALYs – is caused by harmful use of alcohol . Worldwide, alcohol causes more harm to males (6.0% of deaths, 7.4% of DALYs) than females (1.1% of deaths, 1.4% of DALYs) reflecting differences in drinking habits, both in quantity and pattern of drinking ². India which was considered as one of the countries with tradition of abstinence is a thing of past. A nationwide survey on drug abuse showed that the prevalence of alcohol consumption was 21% among men and 2% among women in India. Though this is less compared to international statistics half of them fall under hazardous category and one fifth are dependent drinkers. Spirit accounts for 95% of the alcohol consumed in India and drinking heavily and frequently had become signature pattern among Indians which is of a serious health concern.³ Because of frequent heavy consumption dependence among alcohol consumers had also increased alarmingly. Studies done in Bangalore⁴ and Tamil Nadu⁵ among alcohol users had shown the prevalence of dependence as 14.5% and 33.7% respectively. This study was planned to measure the prevalence of alcohol consumption among adult males and to determine the pattern of drinking, prevalence of dependence and morbidity among alcohol consumers residing in the field

MATERIALS AND METHODS

This cross sectional study was conducted between Jan 2013 and December 2013 in Kalapet, a coastal area in Pondicherry (South India). Study area has a population of 17000 with 5800 houses and fishing is the main occupation of people residing in this area. Adult males aged above 18 years who are living in the area for more than one year were included in the study. Sample size was calculated based on 46.7% prevalence of alcohol consumption among males as reported in a study by John A et al⁶ in Vellore assuming 5% alpha error and 10% deviation. It came to 456 and was rounded to 500. Systematic random sampling was used for selection of the study participants. With 5800 houses and the sample size of 500, the sampling interval was calculated to be 12. So every twelfth house was selected and one adult male from each house was interviewed. If the house was locked or a male member was not available at the time of visit, then the adjacent house was selected. One male member (preferably the head of the house) in every selected house was interviewed. Details regarding socio demographic profile and alcohol consumption habits were collected by interviewing the subjects with a pre-designed and pre tested questionnaire. A complete physical examination was done after the interview.

Operational definitions:

Persons were classified as current alcohol consumers if they had consumed at least one alcoholic drink in the past one year. One standard drink is defined as any drink with net alcohol content of 10 gm ethanol which is 30 ml of spirits (whisky, rum, brandy, gin, vodka or 330 ml (1/2 bottle) beer or 110 ml (1/3 bottle) strong beer or 15 ml of arrack.⁷ Alcohol consumers were classified into light (<5 drinks), heavy (5-8 drinks) and very heavy drinkers (>8 drinks) based on the number of standard drinks consumed per episode.⁷ Alcohol dependence was diagnosed using ICD-10 criteria⁸ for alcohol dependence syndrome. It includes the symptoms of craving, loss of control, physiological withdrawal state, tolerance, salience and persistent use despite physiological or psychological harm. The presence of three or more of the above symptoms in the past one year is defined as alcohol dependence syndrome.

Ethical consideration

The study was initiated after obtaining the approval of PIMS Institutional Ethical Committee, Pondicherry. A written informed consent was taken from each study participant before data collection. For this purpose a participant information sheet indicating the purpose of the study, procedure of maintaining confidentiality and right to not to participate in this study was provided to the participants. Persons identified with alcohol dependence and other significant health problems were counselled and referred for further treatment. Adverse effects of alcohol consumption were explained to all the alcohol consumers.

Out of 500 adult males included in the study 298 were current alcohol consumers which gives the prevalence of alcohol consumption as 59.6%. Among alcohol consumers around 27.5% (82) reported that they consume alcohol 2-3 days in a week and 26.5% (79) reported daily consumption. Brandy was the most preferred spirit among alcohol consumers used by 43.9% (131) followed by beer which was used by 38.3% (114). More than half of alcohol consumers (53.1%) were heavy drinkers consuming 5-8 drinks per episode while 119(39.7%) were light drinkers consuming <5 drinks and 7.2% (21) were very heavy drinkers consuming > 8 drinks per episode. When asked the reason for alcohol consumption 36.9% (110) of the study respondents replied leisure and 35.2% (105) replied as workload. Peer pressure was reported by 9.1% (27) of them and 6.1% (18) told family problem. Around 12.7% (38) of them told that alcohol consumption had become their habit.(Table 1)

Table 1: Pattern of alcohol consumption among alcohol consumers (n=500)

Pattern	n (%)
Frequency	
Daily	79 (26.5)
2-3 days per week	82 (27.5)
Weekly once	71 (23.8)
Occasional	66 (22.2)
Type of alcoholic beverage	
Brandy	131 (43.9)
Beer	114 (38.3)
Arrack	83(27.8)
Whisky	37 (12.5)
Rum	16 (5.4)
Vodka	5 (1.7)
No of standard drinks per episode	
Light drinkers (< 5 drinks)	119 (39.7)
Heavy drinkers (5-8 drinks)	158 (53.1)
Very heavy drinkers (>8 drinks)	21 (7.2)
Reason for alcohol consumption	
Leisure	110 (36.9)
Workload	105 (35.2)
Habit	38 (12.7)
Peer pressure	27 (9.1)
Family problem	18 (6.1)

Out of 298 alcohol consumers, 19.5% (58) were known diabetes mellitus patients, 14.4% (43) were known hypertension patients and 3.7% (11) reported history of cardiovascular diseases. Around 16.1% of alcohol consumers reported history of accidents (either falls or road traffic) at least once under the influence of alcohol consumption. Around 34.2% (102) of the alcohol consumers had dental carries, 14.4% (43) had absent

tooth, 5.1% (15) had leukoplakia and oral ulcer was present in 1.3% (4) of alcohol consumers. Hepatomegaly was present in 18.1% (54) of them and hepato-splenomegaly was present in 9.1% (27) of them. Prevalence of alcohol dependence syndrome was found as 17.7% among 298 alcohol consumers. More than one third of the alcohol consumers had at least one symptom of alcohol dependence i.e craving.(Table 2&3)

Table 2: Morbidity among adult male alcohol consumers (n=298)

Morbidity	n (%)
Diabetes mellitus	58(19.5)
Hypertension	43(14.4)
Cardiovascular diseases	11(3.7)
History of accidents	48(16.1)
Dental carries	102 (34.2)
Absent tooth	43 (14.4)
Leukoplakia	15 (5.1)
Oral ulcer	4 (1.3)
Jaundice	16 (5.4)
Hepatomegaly	54(18.1)
Hepato-splenomegaly	27(9.1)
Sleep disturbances	62 (20.8)
Tremors	41 (13.8)

Table 3: Symptoms of alcohol dependence among alcohol consumers (n=298)

Symptoms	n (%)
Craving	112(37.5)
Loss of control	49 (16.4)
Physiological withdrawal	69 (23.2)
Tolerance	53 (17.8)
Salience	21 (7.0)
Persistent use despite harm	11 (3.7)
Alcohol dependence syndrome*	53(17.7)

*According to ICD-10 criteria, alcohol dependence is defined as 'presence of 3 or more symptoms mentioned above in the past one year'.

DISCUSSION

Our study found that the prevalence of alcohol consumption among adult males was 59.6% (95% CI between 55.4% and 62.8%). A NCD risk factor survey in Tamil Nadu among 5000 households showed the prevalence of male alcohol consumption in the past 12 months was 25.6% in urban areas and 32.7% in rural areas⁷. Another cross sectional study in rural Goa by Dhupdale N⁹ et al among 410 subjects found that the overall prevalence of alcohol consumption was 49% while among males the prevalence was 72%. The free availability of all types of alcoholic beverages from arrack to IMFL at cheaper price in the study area may be one of the reasons for this high prevalence.

In our study among 298 alcohol consumers 79 (26.5%) consume alcohol daily and 82 (27.5%) consume 2-3 times per week. In a study done by Vedapriya R¹⁰ et al in a rural area of Kancheepuram district (Tamil Nadu) among 950 males aged above 30 years, 45.5% had alcohol consumption for at least three times in a week. We also found that among 298 alcohol consumers 53.1% were heavy drinkers consuming 5-8 standard drinks per episode and 7.2% were very heavy drinkers consuming more than 8 standard drinks. Similarly in the IDSP NCD risk factor survey⁷ in Tamil Nadu it was found that 47.1% of alcohol consumers in urban area and 46.7% of alcohol consumers in rural area consume 5 or more standard drinks per episode.

In this study it was found that 18.1% of alcohol consumers have hepatomegaly and 9.1% had hepato-splenomegaly. Alcohol is exclusively metabolized by liver so the oxygen free radicals released during alcohol metabolism affects the liver to a larger extent. Alcoholic Liver Disease is a distinct spectrum of disorders which begins with fatty change in liver and proceeds to hepatomegaly. Further alcohol use will lead to cirrhosis and liver failure and only half of such patients will survive for 5 years. Rehm J et al¹¹ in their review article found the relative risk for developing liver cirrhosis among heavy drinkers as 9.54. Subir Kumar D et al¹² in their review article had stated that 39% of the liver cirrhosis in men throughout the world is attributable to alcohol consumption. We also found that 5.1% of alcohol consumers had leukoplakia and 1.3% had oral ulcers. Similarly Rooban T et al¹³ in their hospital based study found that 7.1% of alcohol users had leukoplakia. A review article by Subir Kumar D et al¹² had also stated that 22% of oral cancers among men worldwide are due to their alcohol use.

The prevalence of alcohol dependence syndrome was found as 17.7% among alcohol consumers based on ICD-10 criteria. Similarly the study by Fathima F et al⁴ among males aged above 18 years in rural Bangalore found that among alcohol consumers dependence was present in 14.5%. A study by Ganesh Kumar S et al⁵ in a rural area of Tamil Nadu had found that 33.7% of alcohol consumers had dependence.

Conclusion:

The above discussion about some of the most common morbidity pattern among alcohol consumers depicts the seriousness of alcohol consumption. Liver cell failure is one of the medical conditions requiring long term and costly treatment. The only mode of treatment at the end stage is liver transplantation. Availability of compatible liver is very difficult and the facility is available only at super specialty hospitals. Liver cell failure is a chronic process passing through various stages and when identified at initial stages of hepatomegaly can be treated completely. Hence screening activity among high risk individuals and intervention can prevent the progress of disease and can save many lives and also money.

The common occurrence of leukoplakia and oral ulcers among alcohol consumers shows that they are more prone

for oral cancers. Other studies had also reported similar results. Oral cancers are very difficult to treat and have high mortality rate. There are also cancers attributed to alcohol which are not included in this study such as gastric carcinoma. Again cancers are chronic diseases requiring sophisticated treatment facilities with poor success rate even when diagnosed at early stage. Primary prevention is the only way to tackle this problem.

Alcohol dependence is one of the most neglected health problems in our country. There is no screening facility for dependence and treatment is available only at limited sites. Most of the dependent patients don't know about their problem. Even if they know, they don't know how to get treatment. Public awareness regarding diagnosis and treatment for alcohol dependence should be increased through extensive health education activities.

Limitations:

This is a cross sectional study so a causal association between morbidity pattern and alcohol consumption cannot be made out. Alcohol consumption habits and symptoms were self reported by the participants and the authors cannot verify them. So there is chance for information bias.

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Study on Knowledge, Attitude and Practices concerning Immunization of under-five children in rural areas of Nalgonda

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ABSTRACT

Background: According to WHO records, 10.6 million children die yearly before the age of 5; while an estimated 1.4 million of those are due to diseases that could have been prevented by vaccines. Aim of this study is to assess the factors affecting immunization coverage of under 5 children in rural Nalgonda. **Materials and Methods:** The present study was a community based cross sectional study conducted in rural field practice areas of Kamnineni Institute of Medical Sciences (KIMS) which is a private medical college in Nalgonda under the department of Community Medicine from July to September. 231 subjects were included in the study. Two stage random sampling technique was used select the sample size. **Results:** It was observed that among 231 children, 208 were fully immunized while 15 were partially immunized and 8 were unimmunized. Male child was more fully immunized compared to the female child. This difference was found to be statistically significant. It was found that the first children of the family were more fully immunized compared to their other siblings. This association was found to be statistically significant. **Conclusion:** 90% of the children were fully immunized. Male children, first born children, Children of Literate and employed care takers have better immunization status compared to their counter parts. The care takers who were informed about immunization, who believed in it and who possess MCP card positively associated with full immunization status.

Key-words: Underfive children, Care takers, Immunization coverage, Socio-demographic factors, Rural areas

INTRODUCTION

Immunization is a powerful public health strategy for improving child survival, not only by directly combating key diseases that kill children but also by providing a platform for other health services.¹ Unlike most other health and development interventions, immunization does not just raise the chances that children will resist a disease, it virtually guarantees they will. ²The historical success of eradicating the dreaded disease, Smallpox, prompted World Health Organization (WHO) to ask its member countries to launch immunization against six vaccine preventable diseases in its national immunization schedule. In May 1974, the WHO launched the Expanded Immunization Programme (EPI) globally, with focus on prevention of 6 vaccine-preventable diseases by the year 2000. In India, EPI was launched in 1978 and it was re-designated as the Universal Immunization Programme (UIP) in 1985, with a goal to cover at least 85% of infants. ³India has one of the lowest immunization rates worldwide despite a longstanding UIP that provides free childhood vaccines.⁴

According to WHO records, 10.6 million children die yearly before the age of 5; while an estimated 1.4 million of those are due to diseases that could have been prevented by vaccines.^{5,6} Worldwide, vaccines can save more than 3 million lives yearly; in addition to protecting million more people from diseases and disability.⁷

Providing community members with information on immunization, health education at facilities in combination with redesigned immunization reminder cards, regular immunization outreach with and without household incentives, home visits, and integration of immunization with other services may improve childhood immunization coverage in Lower- middle income countries.¹ Proper knowledge and practices of caretakers is essential to prevent under vaccination.⁸

Children are considered fully immunized if they receive one dose of BCG, three doses of DPT and polio vaccine each, and one measles vaccine within one year of age. In India, only 44% of children aged 12–23 months are fully vaccinated and about 5% have not received any vaccination at all ⁹Against this backdrop of low vaccination coverage, significant variation exists in the estimated coverage for children aged 12–23 months across the 34 Indian states and Union Territories.

According to National Family Health Survey-4(2015-16) only 67.8% children of age 12-23 months were fully immunized (BCG, Measles and three doses each of polio and DPT) among urban population in Telangana while 68.3% were immunized among rural population.¹⁰ Aim of this is to study society's awareness about child vaccination and will also assess exposure to vaccine-safety-related information, concerns regarding vaccine safety, and

immunization-related knowledge, attitudes, and practices of parents and providers of children. Hence aim of this study is to assess the factors affecting immunization coverage of under 5 children in rural Nalgonda. Objectives of this study are 1) to determine the knowledge, attitude and practices with respect to immunization among respondents (mothers/ responsible guardians) of children aged below 5 years residing in rural practice area of Nalgonda. 2) to correlate demographic, social, maternal and infant related factors associated with incomplete immunization.

MATERIALS AND METHODS

The present study was a community based cross sectional study conducted in rural field practice areas of Kamineni Institute of Medical Sciences (KIMS) which is a private medical college in Nalgonda under the department of Community Medicine from July to September (2 months). The study population were care takers of under five children. Based on non-immunization reported by NFHS-4 (31.7%) sample size of the study is 203 with 20% of relative precision and 95% confidence level. 231 care takers of under five children were participated in the study. Two stage random sampling techniques used to select the sample size. There were 11 villages under RHTC of KIMS. In stage 1 five of eleven villages under RHTC were randomly selected and in stage 2, 231 care takers with children under the age of five were selected randomly and their addresses were noted using under five registers at Anganwadi center. Each care taker was contacted personally and information was obtained using semi-structured questionnaire. **Inclusion Criteria:** 1) Respondents (mothers/responsible guardians) of children under the age of five years. 2) Caretakers of both male and female children. 3) Permanent residents of selected villages. **Exclusion Criteria:** 1) Caretakers who did not consent. 2) Those who were not available even after two visits to their residence. **Data collection:** After taking informed consent, each study subject was interviewed using an oral pre tested, structured questionnaire which was formulated prior to the start of the study. A detailed demographic profile which included age and gender of the child; age, gender, marital status, relation to the child, religion, educational status and occupation of the care taker; family size, family type and family income was taken. Calculation of per capita income and classification of socio economic status was done as per revised B.G Prasad's social classification¹¹

Data was also collected regarding the birth order of the child, belief in vaccination, place of vaccination, immunization status of the child, contraindication of vaccines and reasons for incomplete immunization and vaccination cards/MCP cards (Mother-child protection card).

The following definitions were used to classify immunization status¹²:

Fully immunized- A child who had completed the recommended EPI immunization schedule of

BCG, Hepatitis B, Pentavalent, IPV, Rota and OPV (3 doses) and measles vaccine before one year of age.

Partially immunized- A child who was not yet fully immunized

a) Partially immunized but 'up to date': Child who had received immunization for which he/she was eligible by age criteria and

b) Partially immunized and not 'up to date'; child had not complete the doses of vaccine for his/her age as per schedule.

Unimmunized- A child who had not yet received any vaccine for the age, though eligible.

Data analysis: The data collected through a questionnaire was compiled on windows- EXCEL and analyzed by using SPSS 23rd version statistical software. Appropriate tests of statistical significance (chi square) were carried out to identify associations and results have been tabulated. **Ethical consideration:** Approval of Institutional Ethics Committee was obtained prior to the study. Informed consent from respondents was taken prior to the study. Education was provided to all the subjects in the study regarding the importance of immunization.

OBSERVATIONS AND RESULTS

From the table 1 it was observed that among 231 children, 208 were fully immunized while 15 were partially immunized and 8 were unimmunized.

Table 1: Immunization status of under five children in rural nalgonda. (n=231)

Variable	Number of children	Percentage
Fully immunized	208	90
Partially immunized	15	6.5
Unimmunized	8	3.5
Total	231	100

Table 2: Association of sociodemographic variables of the child with immunization status.

Socio demographic Variable	Fully immunized	Partially and non-immunized	Total subjects	'p' value, ODDs ratio and 95% CI
Sex of the child	Male 119 (98.3%)	2 (1.7%)	121 (100%)	<0.001*
	Female 89 (80.9%)	12 (19.1%)	110 (100%)	
Birth order of the child	First 122 (96.1%)	5 (3.9%)	127 (100%)	<0.001*
	Second 73 (83.0%)	15 (17.0%)	88 (100%)	
	Third 13 (86.7%)	2 (13.3%)	15 (100%)	
	Fourth & above 0 (0.0%)	1 (100.0%)	1 (100%)	

*statistically significant

From the table 2 it was found that the male child was more fully immunized (98.3%) compared to the female child (80.9%). This difference was found to be statistically significant. It was found that the first children (96.1%) of the family were more fully immunized

compared to their other siblings. This association was found to be statistically significant.

Table 3: Association of sociodemographic variables of the caretaker with immunization status.

Socio demographic	Fully immunized	Partially immunized	Total (100%)	'p' value, OD Ds ratio and 95% CI
Variable of the care taker				
Age	<20 Yrs	3 (75%)	1 (25.0%)	4
	20-30 Yrs	179 (89.5%)	21 (10.5%)	200
	30-40 Yrs	22 (100%)	0 (0.0%)	22
	>40 Yrs	4 (80.0%)	1 (20.0%)	5
	Mother	195 (89.9%)	22 (10.1%)	217
Relation to the child	Father	10 (100%)	0 (0.0%)	10
	Other	3 (75.0%)	1 (25.0%)	4
Gender	Male	13 (100%)	0 (0.0%)	13
	Female	195 (89.4%)	23 (10.6%)	218
Religion	Hindu	200 (90.1%)	22 (9.9%)	222
	Others	8 (88.9%)	1 (11.1%)	9
education	Illiterate	27 (81.8%)	6 (18.2%)	33
	Literate	181 (91.4%)	17 (8.6%)	198
occupation	Employed	58 (100%)	0 (0.0%)	58
	Unemployed	150 (86.7%)	23 (13.3%)	173
Family size	≤4	111 (96.5%)	4 (3.5%)	115
	>4	97 (83.6%)	19 (16.4%)	116
Family type	Nuclear	137 (92.6%)	11 (7.4%)	148
	Joint	69 (85.2%)	12 (14.8%)	81
	Three generation	2 (100%)	0 (0.0%)	2
Socio-economic status	Upper	2 (100%)	0 (0.0%)	2
	Upper middle	44 (97.8%)	1 (2.2%)	45
	Middle	69 (90.8%)	7 (9.2%)	76
	Lower middle	53 (82.8%)	11 (17.2%)	64
	Lower	19 (90.0%)	4 (10.0%)	23

*statistically significant

Figure 1. Immunization status of under five children in rural Nalgonda

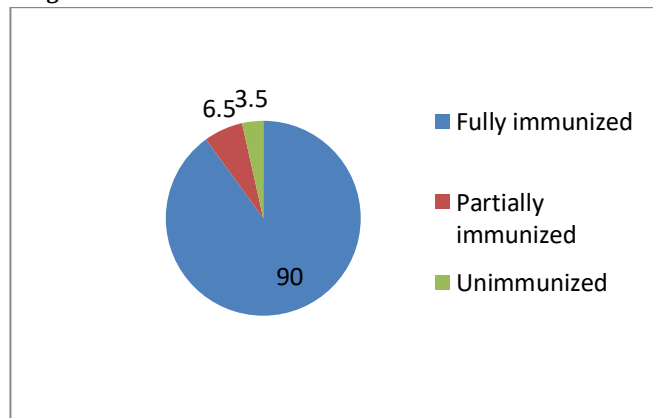


Table 4: Association of other factors with immunization status.

Other factors	Fully immunized	Partially immunized	Total	'p' value, OD Ds ratio & 95% CI
MCP card	Present	197 (92.9%)	15 (7.1%)	212 (100%)
	Absent	11 (57.9%)	8 (42.1%)	19 (100%)
In favor of vaccination	Yes	208 (97.7%)	5 (2.3%)	213 (100%)
	No	0 (0.0%)	7 (100%)	7 (100%)
	Do not know	0 (0.0%)	11 (100%)	11 (100%)
	Government hospitals	190 (92.7%)	15 (7.3%)	205 (100%)
Place of immunization	Private clinics	15 (100%)	0 (0.0%)	15 (100%)
	Both	3 (100%)	0 (0.0%)	3 (100%)
	Both	3 (100%)	0 (0.0%)	3 (100%)
Belief if vaccination prevents disease	Yes	202 (97.6%)	5 (2.4%)	207 (100%)
	No	2 (22.2%)	7 (77.8%)	9 (100%)
	Do not know	4 (26.7%)	11 (73.3%)	15 (100%)
	Yes	3 (15.8%)	16 (84.2%)	19 (100%)
Belief if vaccination is harmful	No	205 (97.2%)	6 (2.8%)	211 (100%)
	Do not know	0 (0.0%)	1 (100%)	1 (100%)
	Do not know	0 (0.0%)	1 (100%)	1 (100%)
Informed about vaccination	Yes	208 (90.4%)	22 (9.6%)	230 (100%)
	No	0 (0.0%)	1 (100%)	1 (100%)
Source of information about vaccination	ANM/ASHA	188 (94.0%)	12 (6.0%)	200 (100%)
	Others	20 (64.5%)	11 (35.5%)	31 (100%)

*= Statistically significant.

From the table 3 it was observed that the association between age of the caretaker and immunization status of the child was found to be statistically insignificant. It was found that male caretakers (100.0%) immunized their children more fully as compared to their female counterparts (89.4%). This association was shown statistically insignificant. All the children who had their fathers as caretakers were fully immunized while it was not the same with the mothers (89.9% of the children were fully immunized) or any other care takers (75.0% of the children were fully immunized). However, this correlation was not found to be statistically significant. A higher immunization coverage was seen in Hindus (90.1%) in comparison with the other religions (88.9%). This association was not statistically significant. Caretakers who were literate showed a better rate of immunization (91.4%) than the illiterate ones (81.8%). This association was not statistically significant. All the caretakers who were employed had their children fully immunized in contrast with the unemployed caretakers (86.7% of them showed a full immunization status of their children). This correlation was found to be

statistically significant. Families comprising 4 or less members showed higher immunization (96.5%) coverage as compared to families with members more than 4 (83.6%). This difference was found to be statistically significant. The association between immunization coverage and family type is summarized in table 5. This association was found to be statistically insignificant. It was found that 100.0% of upper socio economic class, 97.8% of upper middle class, 90.8% of middle class, 82.8% of lower middle class and 90.0% of lower class showed a full immunization status (Table 5). This association was found to be statistically significant. ($p=0.030$).

It was observed from the table 4 that a better immunization coverage was seen in families that had an MCP card in comparison with the families that did not have one (table 4). The difference was found to be statistically significant. Caretakers who were more in favor of vaccination got their children more fully immunized in comparison to those who weren't. This difference was found to be significant. Caretakers who got their children vaccinated at a private set up showed 100% full immunization while the caretakers that got their children vaccinated at a government set up showed a lesser full immunization (92.7%). This difference was found statistically significant. Caretakers who believed that vaccination prevents diseases (97.6%) got their children more fully vaccinated in comparison to those who do not (22.2%). This association was found to be significant. Caretakers who believed that vaccination is not harmful (97.2%) got their children more fully vaccinated in comparison to those who believed it was (15.8%). This association was found to be significant. Caretakers who were informed about vaccines showed a better immunization rate compared those who weren't. This association was found to be significant. The caretakers who were informed by ANM/ASHA got their children fully immunized more (94.0%) when compared to caretakers informed by other sources (64.5%) and this was found to be significant statistically.

DISCUSSION

Childhood immunization almost guarantees protection from many major diseases. It prevents 2 million deaths per year worldwide and is widely considered to be 'overwhelmingly good' by the scientific community.^{14,15} However, 2.5 million deaths a year continue to be caused by vaccine preventable diseases, mainly in Africa and Asia among children less than 5 years old.¹⁴

Thus, there is an urgent need to find ways to increase vaccination coverage and particularly to encourage parents to have their children vaccinated.¹⁶

The principal motive behind conducting this study was to assess the factors that influence the immunization coverage in rural Nalgonda of Telangana.

In this study, 90% (98.3% males and 80.9% females) of the children were fully immunized while 6.5% were partially immunized and 3.5% were unimmunized. This finding was higher compared to National Family Health

Survey-4(2015-16) which revealed that 68.3% were immunized among rural population of Telangana.¹⁰ Although, the rate of immunization obtained from this study was higher than that expected, there is a significant degree of gender bias, poor knowledge and misbelief in regard of immunization. The caretakers of the children may be targeted and educated regarding the benefits and efforts may be made to eradicate the false beliefs of the parents regarding the ill-effects in order to achieve 100% immunization of the society.

Sex of the child: In this study, it was found that the male children were more fully immunized (98.3%) compared to the female children (80.9%). This was in line with a study by Corsi et al whose findings indicated that, at the national level, girls have lower immunization coverage than boys. Gender differences in vaccination coverage are consistent and significant, but do not appear to have increased over time. Girls' coverage for every vaccine (antigen) lags behind boys' coverage in all years, but neither gender displays acceptable age-appropriate coverage levels for any vaccine (antigen).¹⁷ Another study by Singh PK et al showed that despite a decline in urban-rural and gender differences in immunization coverage, children residing in rural areas and girls remain disadvantaged. The inequality trend in immunization coverage implies that the increase in average immunization may not essentially assure the universal and equitable coverage of immunization services, especially to the poor or underserved groups¹⁸, in this case, rural children and girls. This difference in gender may be due to the male preference in the rural areas. In contrast, a study done by Angadi et al showed that the gender of the child was not significantly associated with the immunization status.¹³

Birth order of the child: In the present study, it was found that the first born child of the family was more fully immunized compared to children of higher birth orders. A similar kind of study done in Italy by Angelillo et al indicated that the birth order of the children predicts whether the children were age-appropriately vaccinated according to the mandatory vaccination programme. Indeed, for the children in the study, adherence to the vaccination schedule significantly decreased with the increasing number of older siblings.¹⁹ The association between family attributes and age-appropriate vaccination has already been reported previously in studies that have demonstrated a strong negative association between family size (a variable related to birth order) and vaccination status, since children from larger families are less likely to adhere to the mandatory vaccination schedule.^{20,21,22,23} This trend may have been observed because as the number of children increases, the burden on the family also increases too leading to the younger children being ignored.

Age of the caretaker: In our study, the caretakers belonging to the age group 30-40 years showed a better response in the immunization of their children compared to the caretakers of other age groups. A study conducted in Nigeria by Adenike et al showed a similar response

with majority of the respondents, both at the rural and urban areas being within the age range 26-30 years. The mean age was 31.40 ± 7.21 years in the rural area and (32.72 ± 6.77) years in the urban area.²⁴ However, a study conducted by Mareena et al showed that majority of the mothers belonged to the age group 26-30 (50.3%) and that the age of the mother significantly affects the knowledge regarding immunization.²⁵

Gender of the caretaker: It was found that male caretakers immunized their children fully as compared to their female counterparts. This association was shown statistically insignificant in accordance with a comparative study between India and Pakistan conducted by Subhani et al showed that in Pakistan, the female heads of the family had 0.645 less chance to immunize their children compared to the male heads while the situation in India was different as the female heads 1.140 more likelihood to immunize their children compared to the male heads.¹¹

Sex of the household head was found as a significant predictor of immunization as seen in studies conducted by Babalola in one of his studies.²⁶

Relation of the caretaker to the child: All the children who had their fathers as caretakers were fully immunized while it was not the same with the mothers (89.9% of the children were fully immunized) or any other care takers (75.0% of the children were fully immunized). However, this association was not found to be statistically significant. This was in contrast to a study conducted by Sharma et al which showed that mothers were significantly more likely to be aware about the day of routine immunization (RI) in the week, the number of visits required in infancy and the diseases covered under the RI programme in Delhi likely due to the small size of the study population.²⁷

Religion of the caretaker: A higher immunization coverage was seen in Hindus in comparison with the other religions. When the tests for statistical significance were applied, it was found not statistically significant. Previous vaccination studies^{28,29} that investigated effects of religion on vaccination coverage concluded that non-Hindu religions have poor vaccination outcomes. The lower coverage of full immunization among children of non-Hindu (Muslim) religion is probably because of some parents' mistaken beliefs on the ill-effects of vaccination.²⁹

The effect of religion on immunization status were also summarized in studies conducted by Joseph et al³⁰, Singh PK et al¹⁸ etc. This difference is observed because of a few orthodox beliefs that hinder the immunization of the child by preventing any form of medical intervention.

Education of the caretaker: literate caretakers showed a better rate of immunization of their children than the illiterate ones but this association was not statistically significant. As stated by K.Vikramet al³¹, this may be because educated mothers may have better knowledge of good medical practices and thus be more aware of the benefits of medical care. Maternal education has often been suggested to be the single most important factor

explaining differentials in child health outcomes. Mothers' education leads to better human, social, and cultural capitals which then help increase immunization rates for their children. In a study conducted by Nenna TB et al³², it was found that most of the mothers had tertiary or secondary education. This seemingly high literacy level may have influenced the knowledge of the reason for immunizing children.

Occupation of the caretaker: It was found that employed mothers immunized their children more fully and this finding was significantly in line with the results of the studies conducted by Adenike et al²⁴, Antai et al³³ showed that Mother's occupation is a factor that influences vaccination uptake and that being employed was significantly associated with higher likelihood of the child being fully immunized.

Socioeconomic status: The study revealed that children belonging to upper and upper middle classes showed a better immunization status. This was similar to results of a study by Joseph et al which indicated that monthly income of parents significantly affected the vaccination status. The number of partially vaccinated children was higher among parents having family income <10,000 Rs. per month. This is probably due to the fact that subjects of higher Socioeconomic classes have better access to health care facilities and hence the better immunization coverage.³⁰

MCP card: The presence of MCP card among the parents showed a higher full immunization coverage of their children but this parameter was not found to be statistically significant. A study by Birhanu in Ethiopia stated that as far as the practice on infant immunization is concerned, about 98.7% of mothers had and showed EPI card- an analogue of the MCP card on the spot of immunization.³⁴

Place of immunization: Caretakers visiting a private clinic showed 100% full immunization while the caretakers that got their children vaccinated at a government hospitals showed a lesser full immunization (92.7%) and this difference was found statistically significant. Joseph J et al in their study, reported that parents who attended private clinic were found to be aware of optional vaccines compared to parents who attended government hospitals. This knowledge has translated into practice as a higher proportion of parents (21%) who attended private clinic had opted for additional vaccines as compared to those who attended (6%) government hospital.³⁰ The reason for this could've possibly been the better availability of specific vaccines in those private institutions. However, this cannot be completely assessed due to the small sample size.

Belief if vaccination prevents diseases: The caretaker's belief in the potency of vaccination to prevent diseases significantly affected the immunization status. However, in a study done by Angadi et al, it was seen that although a vast majority of the respondents agreed on the fact that immunization was important to protect their children from diseases, most of them could not even name one disease that immunization provided protection against.¹³ Similar

findings were seen in the study conducted by Manjunath et al., who concluded that though many were aware of the importance of vaccination in general, specific information on importance of completing the schedule and knowledge on vaccine preventable diseases other than poliomyelitis were very limited.³⁵ In contrast, study by Benin et al, showed that the main reason for non-immunization of the child was the misbelief that the child would get the diseases anyway and that vaccine-preventable diseases are 'not so bad'.¹²

Belief if vaccination is harmful: In this study, the belief of the caretaker that immunization is harmful and the immunization status were insignificantly related. A study by Helen Petousis-Harris in New Zealand showed that caretakers expressed concern about the immediate pain associated with vaccination and fear that the vaccination could cause serious long-term damage to the child.³⁶

Source of information: ANM/ASHA workers acted as a major source of information regarding immunization and were responsible for a higher degree of full immunization status among the under-five children. Studies by Angadi et al¹³, BholaNath et al³⁷, MC Singh et al³⁸ and N Gulati et al³⁹ reported similar findings and stated that the sources of information regarding immunization among completely immunized children were found to be mainly health personnel and anganwadi workers.

Limitations: While the data collection was designed to be representing the rural population of Nalgonda, there could be some degree of bias in the sampling as only a few randomly selected caretakers were considered. This limits the insights that can be drawn from the data.

The data presented in the paper shows only the reality of the participating subjects and may not be extrapolated to the population as a whole.

CONCLUSIONS: It was concluded from the present study that 90% of the children were fully immunized. Male children had better immunization status compared to female children. First born children were showing better immunization status compared to children of other birth order. Children of Literate and employed care takers have better immunization status compared to illiterate and unemployed care takers. As family size and socioeconomic status were inversely associated with immunization status of children. The care takers who were informed about immunization, vaccines that prevent diseases, who believed in it and who possess MCP card positively associated with full immunization status of under five children.

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Limitations: Appropriate sampling method to assess the immunization coverage is cluster sampling technique. But because of logistics constraints two stage random sampling method was used to take the sample size.

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Etiological profile and antibiotic sensitivity pattern of uropathogens in children at a teaching hospital, Thrissur

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ABSTRACT

Background: Urinary tract infection (UTI) is very common among community-based and hospitalized children. Approximately 3-8% of girls and 1% of boys are diagnosed with UTI, and may lead to serious complications if not treated appropriately. Empirical treatment of UTI with antibiotics leads to antibiotic resistance. The choice of antibiotics should be based on a basic knowledge about current causative uropathogens and their susceptibility patterns. **Objectives:** To determine the aetiologic profile and antibiotic susceptibility of uropathogens in children at a teaching hospital. **Methodology:** A record-based retrospective study was conducted using a total of 129 positive urine culture and sensitivity reports (bacterial count $\geq 10^5$ CFU / ml of urine) of children with suspected UTI between February 2011 and January 2012 at a teaching hospital in Thrissur. Data were entered using Microsoft Excel 97, and analyzed by Epi-Info, EZR. **Results:** E. coli (2(63.6%)) and Klebsiella (23(17.8%)) were the commonest uropathogens followed by Enterococci (8.5%) and Proteus (6.2%). Infants (54(41.9%)) were more frequently affected than the older age-groups. More males (74(57.4%)) were affected as compared to females. E.coli isolates were found predominantly in boys while Klebsiella isolates were more frequent in girls. Over 80% of both isolates were sensitive to Amikacin, Cefoperazone and Piperacillin-Tazobactam while >70% were sensitive to Gentamicin and Nitrofurantoin. Klebsiella also showed more than 80% sensitivity to Ciprofloxacin and Norfloxacin. Both organisms were highly (>90%) resistant to ampicillin. **Conclusion:** E.coli was the commonest uropathogen, followed by Klebsiella. Treatment strategies and antibiotic policy should be informed by the etiology and sensitivity patterns of uropathogens.

Key-words: Urinary tract infection, etiology, antibiotic sensitivity, children

INTRODUCTION

Urinary tract infections (UTI) are one of the most common bacterial infections seen in children. It has been estimated that UTI are diagnosed in 1-2% of boys and 3-8% of girls.¹⁻⁵ Although the true incidence of urinary tract infections (UTIs) in children is difficult to estimate, they are one of the most common bacterial infections seen by paediatricians. Except for the first 8 to 12 weeks of life, when infection of the urinary tract may be secondary to a haematogenous source, UTI is believed to arise by the ascending route after entry of bacteria via the urethra.⁶

Approximately 3% of prepubertal girls and 1% of prepubertal boys are diagnosed with UTI, and is a major cause of morbidity, that may lead to urosepsis, urolithiasis, permanent renal parenchymal damage, HTN and end-stage renal disease if not treated appropriately.⁷⁻¹⁰ The fact that 30% of children with urinary tract anomalies first present with a UTI, underscores the importance of appropriate early management.¹¹ All age groups, and both hospitalized and non-hospitalized individuals are affected by UTI, often with serious impacts on their socioeconomic life. It accounts for a large proportion of antibacterial drug consumption and treatment failure due

to increasing resistance to common antibiotics.^{1,6,12} UTI is a major public health problem worldwide that is commonly encountered in medical practice. However, in resource-poor settings, its treatment is usually empiric due to the high cost and long duration required for culture and antibiotic susceptibility testing.¹³ In most cases, family physicians provide empirical treatment without the benefit of a pre-therapy urine culture.⁶ Nevertheless, the use of an appropriate antibiotic is essential to prevent development of long-term complications.¹⁴

In developing countries, area-specific monitoring studies about the aetiopathogenesis of UTI and their resistance patterns can help clinicians to choose the correct empirical treatment.¹ Moreover, since antibiotic resistance in children hospitalized with UTI is high, susceptibility testing should be carried out periodically on the clinical isolates and the empirical antibiotic treatment should be altered accordingly.¹⁵ With the problem of antimicrobial resistance on the rise,¹⁶ a knowledge of antibiotic susceptibility pattern is essential for successful eradication of invading pathogens and evaluation of effective therapeutic options at the primary health care

level.^{1,2,12,15,16} Even in a single geographical area, antibiotic sensitivity patterns change over time.¹⁷⁻¹⁹ Ideally, continuous regional surveillance should be performed to detect these changes.⁹ However, this may not be feasible due to various practical and logistical reasons. Serial measurements offer a less resource-intensive alternative to continuous surveillance.¹⁸ Thrissur is the cultural capital of Kerala, and boasts of several tertiary care institutions. Although there is a recent interest in studying antibiotic sensitivity patterns of uropathogens, there is scant past data for comparison. It is in the above-mentioned context that this study was conducted at a teaching hospital in Thrissur with the following objectives:

1. To determine the aetiological profile of uropathogens in children at a teaching hospital.
2. To assess the antibiotic susceptibility pattern of the causative uropathogens.

MATERIALS AND METHODS

Study design: A record based retrospective study of urine culture and sensitivity reports of children who had presented with symptoms of UTI at the paediatrics department of a teaching hospital in Thrissur.

Study setting: A 1000 bedded (teaching) hospital in Thrissur district of central Kerala.

Study period: Data was collected during September 2012 to October 2012 to assess the culture and sensitivity reports of uropathogens in children with UTI, pertaining to a one-year period from 1st February 2011 to 31st January 2012. **Study procedure:** There were 129 positive urine culture and sensitivity reports of pediatric patients with UTI, pertaining to the above-mentioned period were obtained from among 477 urine samples given for testing.

Ethical considerations: Ethical approval was obtained from the institutional ethics committee. Permissions for the study were obtained from the departments of Paediatrics and Microbiology. All data were coded to exclude personal identifying information, and stored in a password protected computer. Access to the data were restricted to the investigators. **Inclusion criteria:** Positive urine culture reports of children attending the paediatric out-patient (OP) or in-patient (IP) department with suspected UTI were included in this study. Based on the fact that five bacteria per HPF represents roughly 100,000 colony-forming units (CFU) per ml, which is the classic diagnostic criterion for asymptomatic bacteriuria and certainly compatible with UTI. A reported bacterial count of $\geq 10^5$ CFU / ml of urine was therefore considered as the cut-off for a positive urine culture.²⁰

Statistical analysis: Age-wise data of all 129 paediatric patients who had tested positive for urine culture were collected and the prevalence of the uropathogens and their antibiotic susceptibility pattern was tabulated by noting their frequency and percentage. Data entry was done using Microsoft Excel 97 and the results were analyzed by using Epi-Info Statistical package Version 16 and EZR (version 1.36) [R Commander version 2.4-0; R version

3.4.1].²¹ The Chi-square test was applied to determine whether there was any statistically significant difference in sensitivity between the various drug classes ($p < 0.05$) for the two most common uropathogens in this study, namely *E. coli* and *Klebsiella* at the 5% level.^{22,23}

RESULTS

Out of a total of 477 urine samples that were collected during a one-year period from January 2011 to February 2012, there were 129 urine samples that were reported to be culture positive (bacterial count $\geq 10^5$ CFU / ml of urine). Among the 129 children study subjects who were culture positive, there were 73 (57.4%) males and 56 (42.6%) females. Their age-wise distribution showed that the majority (54) of the culture-positive urine samples were those of infants, while 41 samples belonged to children in the 1– 5 year old age-group and the remaining 34 were those of children above 5 years of age (**Table 1**).

Table 1: Age-wise distribution of study subjects

Age in years	Frequency	Percentage
Up to 1yr	54	41.90%
1 – 5 yrs	41	31.80%
> 5 yrs	34	26.30%
Total	129	100%

Table 2: Frequency of uropathogens in study subjects

Organism	Frequency	Percentage
Escherichia coli	82	63.60%
Klebsiella	23	17.80%
Enterococci	11	8.50%
Proteus	8	6.20%
Staphylococcus	4	3.10%
Pseudomonas	1	0.80%
Total	129	100%

In this study, there were six different types of uropathogens that were isolated, namely *Escherichia coli* (*E. coli*), *Klebsiella*, *Enterococci*, *Proteus*, *Staphylococcus* and *Pseudomonas*. The most common uropathogen was *E. coli* which was found in 82 (63.6%) children, followed by *Klebsiella* in 23 (17.8%), *Enterococci* in 11 (8.5%) and *Proteus* in 8 (6.2%) of the patients. *Staphylococcus* was responsible for 4 cases of UTI while there was only a single case of UTI due to *Pseudomonas* (**Table 2**).

Table 3: Age-wise distribution of uropathogens

Organism	< 1 yr	1-5 yrs	> 5 yrs
	n (%)	n (%)	n (%)
Escherichia coli	34 (63%)	29 (70.7%)	19 (55.9%)
Klebsiella	11 (20.4%)	6 (14.6%)	6 (17.7%)
Enterococci	7 (13%)	3 (7.3%)	1 (2.9%)
Proteus	1 (1.8%)	2 (4.9%)	5 (14.7%)
Staphylococcus	1 (1.8%)		0 3 (8.8%)
Pseudomonas		0 1(2.5%)	0
Total	54	41	34

The ages of the children with positive UTI reports were stratified into 3 groups (>1 year, 1-5years and >5 years) so as to indicate the age-wise distribution of uropathogens. It was noted that E. coli was the most common organism followed by Klebsiella and Enterococci. Even among infants, the most common uropathogen was E. coli which was found in 34 (63%) of infants, followed by Klebsiella in 11 (20.4%) and Enterococci in 7 (13%) infants. Proteus and Staphylococcus isolates were found in 5 (14.7%) and 3 (8.8%) respectively, of samples from among the older age group (>5 years) as compared to the younger age-groups. (Table 3).

Table 4: Antibiotic susceptibility pattern of uropathogens

Antibiotic susceptibility	E.coli (n=82)		Klebsiella (n=23)	
	S* %	R** %	S* %	R** %
Nitrofurantoin	97.1	2.9	75	25
Amikacin	95.7	4.3	94.1	5.9
Piperacillin + Tazobactam	90.5	9.5	91.7	8.3
Cefopirazole	85	15	100	0
Gentamicin	76.8	23.2	70	30
Ciproflox	57.4	42.6	87.5	12.5
Ceftriaxone	55.1	44.9	52.6	47.4
Norflox	52.7	47.3	82.4	17.6
Cefpirome	52.2	47.8	55.6	44.4
Bactrim	51.4	48.6	56.5	43.5
Cefotaxim	50.9	49.1	41.2	58.8
Cefuroxime	46.4	53.6	27.5	72.5
Cefixime	46.4	53.6	37.5	62.5
Cefazolin	27.6	72.6	60	40
Ampicillin	9	91	4.8	95.2

S* : Sensitive; R** : Resistant

Data on antibiotic susceptibility showed that E. coli was highly sensitive to Nitrofurantoin (97.1%), Amikacin (95.7%), Piperacillin + Tazobactam (90.5%), Cefoperazone (85%) and Gentamicin (76.8%).

Klebsiella was found to be highly sensitive to Cefopirazole (100%), Amikacin (94.1%), Piperacillin + Tazobactam (91.7%), Ciprofloxacin (87.5%), Norfloxacin (82.4%), Nitrofurantoin (75%) and Gentamicin (70%). On the other hand, both E. coli and Klebsiella were highly resistant to Ampicillin (91% and 95.2% respectively). It was noted that E.coli was also resistant to Cefazolin (72.6%) while Klebsiella showed resistance to Cefuroxime (72.5%). The susceptibility of E.coli and Klebsiella to other antibiotics such as Ciprofloxacin, Ceftriaxone, Norflox, Cefpirome, Bactrim, Cefotaxim, Cefuroxime and Cefixime were in the intermediate range of 45% to 55% (Table 4).

To find out the association between antibiotic sensitivity of uropathogens and class of drugs, the urinary antibiotics tested in this study were classified and grouped as follows: Nitrofurans (eg. Nitrofurantoin), Aminoglycosides (eg. Amikacin and Gentamicin),

Cephalosporins (eg. Cefopirazole, Ceftriaxone, Cefpirome, cefotaxim, Cefuroxime, and Cefixime), Fluoroquinolones (eg. Ciprofloxacin, Norfloxacin), Extended spectrum Penicillins (eg. Piperacillin+Tazobactam), Oral Penicillin (eg. Ampicillin) and Sulpha combinations (eg. Bactrim). The details of statistical analyses to determine if there is any difference in sensitivity among the various groups of antibiotics for the two commonest uropathogens, E.coli and Klebsiella, are presented in Table 5. Statistically, there was a highly significant difference ($p < 0.0001$) in sensitivity between drug classes for both E. coli and Klebsiella.

Table 5: Association between antibiotic sensitivity of uropathogens and drug class

Antibiotic class	E. coli		P value	Klebsiella		P value
	S* n (%)	R** n (%)		S* n (%)	R** n (%)	
Nitrofurans (Nitrofurantoin)	80 (10.9%)	2 -0.40%	<0.0001	17 -7.90%	6 -4.60%	<0.0001
Aminoglycosides	141 (19.2%)	23 -4.60%		38 -17.70%	8 -6.20%	
Extended spectrum penicillins	74 (10.1%)	8 -1.60%		21 -9.80%	2 -1.50%	
Cephalosporins	299 (40.8%)	275 (55.3%)		86 -40%	75 -57.70%	
Fluoroquinolones	90 (12.3%)	74 -14.90%		39 -18.10%	7 -5.40%	
Sulphonamides (Combination)	42 (5.7%)	40 -8.00%		13 -6.00%	10 -7.70%	
Penicillin (Ampicillin)	7 -1.00%	75 -15.10%		1 -0.50%	22 -16.90%	
Total	733 (100%)	497 (100%)		215 (100%)	130 (100%)	

DISCUSSION

In this retrospective record-based hospital study conducted during September to October 2012, there were a total of 129 culture-positive urine sample reports (with bacterial count $\geq 10^5$ CFU / ml of urine), of children who had attended the paediatric department of a teaching hospital in Thrissur.

The majority (54) culture positive urine samples were those of infants, followed by those in the older age groups. The sex-wise distribution of UTI indicated a higher prevalence (57.4%) among male children as compared to females (42.6%). A higher prevalence of UTI in boys in the first year of life is consistent with another study wherein boys had higher UTI rates during infancy and majority of the UTI in boys occurred in the first three months of life.²⁴ Both the patients' age and gender are significant factors in determining the etiology of UTI and can increase accuracy in defining the

causative uropathogen as well as provide useful guidance for empiric treatment.²⁵

The most common uropathogens in our study were *Escherichia coli* (63.6%) and *Klebsiella* (17.8%), followed by a few cases of *Enterococcus*, *Proteus*, *Staphylococcus* and *Pseudomonas*. Similar findings were also observed in several other studies.^{6,12,25,26} Gram negative organisms are the most commonly isolated organisms, with *E. coli* accounting for 70 to 90% of infections.²⁷ Studies carried out in infants and children to determine the type of organisms causing UTI have shown that *E. coli* was the most commonly cultured organism followed by other organisms including *Klebsiella*, *Pseudomonas*, *Proteus* and *Enterobacter*.²⁸

In a retrospective hospital-based study of urine culture records of patients diagnosed with UTI in Singapore, the commonest organism isolated for all age groups and gender was *Escherichia coli* (74.5%) followed by *Klebsiella* (8.7%).²⁹ In a community-based study,³⁰ of urine culture and sensitivity reports from outpatients clinics of an urban area of north Italy over a 22-month period, it was seen that *E. coli* accounted for 67.6% of all isolates, followed by *Klebsiella pneumoniae* (8.8%), *Enterococcus faecalis* (6.3%) and *Proteus mirabilis* (5.2%). This trend was also noted in an 11-year analysis of prevalent uropathogens and the changing pattern of antibiotic resistance by *E. coli* in a community-based study at Dublin, wherein the prevalence of *E. coli* was seen to be increasing in recent years in community UTIs with 70.4 % of UTIs in the community caused by *E. coli* in 2009.³¹

Our study on antibiotic susceptibility showed that the most common uropathogen namely *E. Coli* was highly sensitive to Nitrofurantoin (97.1%), Amikacin (95.7%), Piperacillin + Tazobactam (90.5%) and Cefoperazone (85%), along with moderate sensitivity to Gentamicin (76.8%). *Klebsiella*, the second most common uropathogen in this study, showed a high degree of sensitivity to Cefapirazone (100%), Amikacin (94.1%), Piperacillin +Taxobactam (91.7%), Ciproflox (87.5%) and Norflox (82.4%) with considerable sensitivity to Nitrofurantoin (75%) and Gentamicin (70%). Similar findings of high susceptibility of *E. coli* and *Klebsiella* to Amikacin, Nitrofurantoin, Piperacillin + Tazobactam and Gentamicin have been reported from many studies.^{6,12,15,16,20,24,32}

Most cases of UTI are uncomplicated, and family physicians may thus provide empirical treatment for these patients without the benefit of a pre-therapy urine culture. Ideally, antibiotics have to be given for seven days and the child reviewed after two days.³³ Guidelines for the management of UTI and appropriate empirical therapy rely on the predictability of these agents causing the infection and knowledge of their antimicrobial susceptibility patterns. Empiric selection of antimicrobial agents should be based on the antibiotic sensitivity pattern of the uropathogens prevalent in that area, which is derived from epidemiological studies carried out in that environment. This must be guided by clinical evidence as

well as the safety profile and appropriateness of the drug.³⁴ Nitrofurantoin has been used for more than five decades for the treatment of uncomplicated cystitis and it was found to remain active against most of the uropathogens. Recent data suggests that nitrofurantoin has retained a good amount of sensitivity (90.98%) against both *E. coli* and *Klebsiella*. The absorption of oral nitrofurantoin is 40-50% and is enhanced when taken with food. The drug has minimal side effects and can be safely used for the treatment of uncomplicated cystitis even during pregnancy.³⁵ Even though antibiotics such as Amikacin, Cefaperazone, Gentamicin were also found to be highly sensitive, they are injectable drugs and therefore, are used more often in hospital settings than in the community, thereby increasing the risk of development of resistant strains in the hospital surroundings.³⁶

In this study, both *E. coli* and *Klebsiella* were found to be highly resistant to Ampicillin (91% and 95.2%) respectively, and this trend was observed in many other studies with varying degrees of resistance.²⁸⁻³¹ More importantly, a similar pattern has been recently reported from the same geographical area where this study was conducted. However, the resistance of *Klebsiella* to ampicillin was 100%. There was a reduction in sensitivity of *E. coli* to Nitrofurantoin, from 97.5% in this study, to 90% in the other study.³⁷ This change would not have been identified without the benefit of the findings of this study, and underlines the need for suitable baseline data. Both *E.coli* and *Klebsiella* showed varying degrees (40-60%) of moderate resistance to antimicrobials such as Ceftriaxone, Cefpirone, Bactrim, Cefotaxim, Cefuroxime and cefixime. A cut-off point of 20 % has been suggested as the level of resistance at which an agent should no longer be used empirically.³³

The fact that both *E. coli* and *Klebsiella* showed the highest resistance (more than 90%) to Ampicillin is an indicator of the increasing rate of antibiotic resistance to the commonly prescribed antimicrobial agents and is a matter of concern. The antibiotic resistance pattern of the two principal UTI pathogens, *E. coli* and *Klebsiella* appears in general to be as that found in other parts of India and the globe.³⁹⁻⁴¹ but the trend of antibiotic susceptibility pattern has to be detected periodically to select appropriate treatment regimen and especially to identify those children at risk for recurrent UTI in developing countries through referring children with two or more UTI episodes in the past year for definitive urine testing and paediatric consultation.³³

Limitations of the study:

This study was hospital-based, and so the results may not be generalized to the community at large.

Being a retrospective study that was limited to one particular teaching hospital may have lead to bias. Since the method of collection of urine has not been clearly specified, there may have been errors in the urine susceptibility results.

Conclusion:

The results of our study have indicated that *E. coli* and *Klebsiella* are the main aetiological agents in paediatric UTI in a tertiary care hospital in central Kerala. Even though the role of these two uropathogens as major contributors in UTI children has not changed, their antibiotic susceptibility pattern has changed considerably. Our study has revealed a high statistically significant difference in the susceptibility (<0.0001) between the different drug groups for the two predominant uropathogens namely *E. coli* and *Klebsiella*. Drugs such as Ampicillin and Bactrim which were frequently used in the treatment of UTIs are now showing considerable resistance. To avoid this situation, surveillance of antibiotic resistance patterns should be done periodically and an antibiotic policy should be made accordingly. This will facilitate the introduction of appropriate changes in the effective management of UTI in general, and in children in particular. Among the oral urinary antibiotics, Nitrofurantoin has been found to be highly effective against both *E. coli* and *Klebsiella* and can be considered as an appropriate drug for empiric treatment of UTI, while awaiting the culture and sensitivity results.

Recommendations:

The aetiology and resistance patterns of organisms in UTIs are not predictable, necessitating reappraisal by culture and sensitivity testing from time to time. Since the antibiotic sensitivity pattern of uropathogens is changing, it must be taken into account when selecting treatment plans. Antibiotic policies should be formulated as per local surveillance data.

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Utilization of Antenatal and Postnatal services among Women residing in Urban Slums

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ABSTRACT

Background: Maternal health care services play a major role in reducing morbidity and mortality among women of reproductive age group which has a remarkable influence by several factors, distinctly in developing countries. Continuum of care throughout pregnancy and in postnatal period is of paramount importance and thus helps in emphasizing a safe motherhood practices. **Objectives:** To compare utilization of ANC and PNC services and factors affecting these services among women residing in urban slums. **Methods:** Cross sectional study was done in urban slums and data was collected from women who had delivered one year prior to the study by conducting house to house survey after taking consent, using a pre-designed and pre-tested proforma. Descriptive statistics, Chi-square test and Odds ratio were applied. **Results:** Mean age of study participants was 24.21±3.08 years. 57.54% were educated till high school and 71.51% belonged to lower class. 87.15% women had registered their pregnancy in the first trimester. In comparison, 63.13% had utilized full ANC package compared to 17.88% PNC package ($P<0.05$). Literacy status and awareness played a major role in utilizing the maternal care services ($p<0.05$). **Conclusion:** Utilization of PNC services was very minimal as compared to ANC. Literacy and social class plays major role in utilization of these services. Thus, there is need for strengthening PNC services utilization to match up with ANC services, which can be achieved by imparting health education and community participation at all levels of the health care, which can be done at a minimal cost.

Key-words: Healthcare, Maternal, Slums, Urban, Utilization.

INTRODUCTION

Maternal healthcare is a major component of primary healthcare¹ which has always remained as a major challenge to the global public health system, predominantly in developing nations.² Maternal health situations in the country has been impeding despite various changes in a rapidly developing socioeconomic environment³ and investment in health infrastructure.⁴ Pregnancy and child birth are events where in both women and children are more vulnerable to morbidity and mortality.⁵ It is widely accepted fact that the use of maternal health services has a potential effect in reducing maternal morbidity and mortality. However, the utilization of maternal health services is inadequate which is influenced by variety of factors⁶ like literacy, socioeconomic status, occupation of the woman and number of pregnancies also. Majority of maternal casualties can be prevented by providing women access to basic and effective maternal health services⁷ during pregnancy, childbirth and postnatal period¹ and by strengthening the services to cater the needs of vulnerable.⁸

Antenatal care (ANC) service is the essential component in the primary health care services of a country, which aims for a healthy society.³ World Health Organization

(WHO) new antenatal care model increases the number of contacts/visits a pregnant woman has with healthcare providers throughout her pregnancy from four to eight. Focusing on a positive pregnancy experience, these new guidelines seek to ensure not only a healthy pregnancy for mother and baby, but also an effective transition to positive labour, childbirth and ultimately to a positive experience of motherhood,⁹ whereas postnatal period is the critical phase in the lives of mothers and newborn babies, constituting to most maternal and infant deaths. According to WHO, at least three home visits by health care workers, continuation of consumption of iron and folic acid tablet by 42 days of delivery, caring of infection, management of postpartum hemorrhage, breast feeding and nutrition education, postpartum exercise and advice of having suitable family planning devices are the basic services required to the mother during the postnatal period.¹ Ensuring appropriate postnatal care is of paramount importance in safeguarding maternal and newborn health, in India where health risks results from the vicious cycle of malnutrition, poverty¹⁰ as well as literacy status of the family.

Rapid urbanization has led to increase in migration of people from rural to urban areas in search of livelihood,

enhancing the growth of slums, which have very poor access to basic amenities, poverty and unhygienic living conditions. The fast growth of slums has deleterious impact on maternal and child health causing an increase in the mortality and morbidity.⁵

In developing countries although there is provision of maternal health services but there is lack of its awareness and effective utilization. Thus, the present study was conducted with objectives of assessing the utilization of antenatal and postnatal care services and the factors affecting in availing these services among women residing in urban slums.

MATERIAL AND METHODS

Study design and setting

This study was a community based, cross-sectional study, which was carried out for a period of six months. The study was conducted among women who were in postnatal period, residing in the urban slums, which is the field practice area of Urban Health Training Centre attached to a tertiary care hospital.

Sampling method:

The overall sample size calculated was 179, using the formula $4pq/L^2$, where p is the prevalence 35.86%,¹¹ q = 1-p (64.14%) and L the permissible error, taken as 20% at 5% alpha error. The total population of urban field practice area is 20,000. With an average family size of 7 members, 2000 families were residing in the study area. To achieve the required sample size, every 11th family was selected and only one woman from each family was included in the study as she was considered to be representative of the selected family and to avoid duplication, so that entire population was covered.

Sampling procedure:

House to house survey was carried out by the investigators, by doing systematic random sampling (every 11th house was considered), if there was no study participant (mother) in the 11th house, then as per the procedure followed in systematic random method, the next houses were considered (i.e. 12th, 13th, 14th and so on). Later, as per the protocol systematic sampling method was continued considering 21st, 31st houses and so on till the required sample size was achieved. With the help of anganwadi workers and medico social workers helped in developing rapport with the study participants. One woman was selected from each house and she was considered as representative of the family. No other woman was selected from the same family, so as to avoid duplication of the data and recall bias.

Inclusion and exclusion criteria:

Women who had delivered one year prior to the study, residing in the study area for more than one year and who gave consent on a voluntary basis to participate in the study were included. Women who did not comply with the inclusion criteria were excluded.

ANC package: Complete antenatal package includes those mothers who had a minimum of three antenatal visits, at least two tetanus toxoid injections during the pregnancy, or received one tetanus toxoid injection during

the pregnancy and at least one in the three years prior to the pregnancy, and received iron and folic acid tablets for 90 days or more.²

PNC package: A woman should receive at least three home visits by health workers, continuation of iron folic acid and calcium tablets, management of postpartum haemorrhage, caring of infection, getting education about breast feeding, nutrition, family planning services and postpartum exercise.¹

Data collection:

Data was collected by interviewing all 179 delivered women by conducting house-to-house survey using a pre-designed and pre-tested semi structured proforma, which included socio-demographic profile, monthly income, antenatal and postnatal services utilization details. The questionnaire used in the study was translated to vernacular language and validated by the investigators. Data was collected after signing a written informed consent form on voluntary basis and confidentiality was assured. Data analysis was done using SPSS software version 22.0. Descriptive statistics and Chi-square test was applied to find an association between two attributes and P < 0.05 was considered as statistically significant.

RESULTS

A total of 179 women participated in the study. The socio-demographic characteristics of the study participants are shown in Table.1, where majority of 54.75% were in the age group of 21-25 years. 57.54% women had completed high school education, 71.51% belonged to Class V socio-economic status [(SES), Modified B. G. Prasad's Classification 2017 - India].¹⁴

Table. 2, depicts antenatal details of study participants, where in 51.96% women took ANC services at government hospital. Majority of the women 87.15% had registered their pregnancy in first trimester, and 65.93% of women had taken ≥ 3 visits. Two doses of TT injection were taken by 75.98% women. Intake of IFA and calcium tablets was seen in 57.54% of the women. 63.13% of women had utilized the complete ANC package.

Table. 3, describes post natal details of study participants. 30.17% of the women had availed a minimum of three post natal visits. A majority of 79.89% women had not continued intake of iron and folic acid tablet during the post natal period. 87.15% and 64.80% of women were educated about breast feeding practices and family planning services respectively. A larger number of women 88.27% were not advised regarding post natal exercises. The complete PNC package utilization was fulfilled by 17.88% of women.

Table. 4, shows comparison of ANC and PNC utilization among study participants. It was found that 63.13% had utilized full ANC package when compared to PNC package which was only 17.88% ($\chi^2=76.05$, df=1, OR=7.865, 95% CI=4.826 -12.82, P<0.05, Significant).

This shows that ANC package is utilized 8 times more than PNC services.

Table 1. Demographic characteristics of study participants (n=179)

Demographic characteristics	Number	Percentage
Age (years)		
15-20	4	2.24
21-25	98	54.75
26-30	56	31.28
31-35	21	11.73
Religion		
Hindu	48	26.82
Muslim	128	71.51
Christian	3	1.67
Others (Jain, Sikh)	0	0
Educational status		
Illiterates	19	10.62
Primary (1-7)	37	20.67
High school (8-10)	103	57.54
Intermediate (11-12)	12	6.7
Graduate & above	8	4.47
Socioeconomic status(B.G. Prasad classification 2017)		
Class I	0	0
Class II	4	2.23
Class III	11	6.15
Class IV	36	20.11
Class V	128	71.51

Table 2. Antenatal details of study participants (n=179)

Antenatal registration	Number	Percentage
1 st trimester	156	87.15
2 nd trimester	18	10.06
3 rd trimester	5	2.79
Gravida		
First	148	82.68
Second	23	12.85
Third	8	4.47
Place of registration		
Government hospital	93	51.96
Private hospitals	67	37.43
Medical colleges	19	10.61
Antenatal visits		
1	4	2.23
2	57	31.84
≥3	118	65.93
Intake of IFA and Calcium		
Yes	103	57.54
No	76	42.46
TT doses		
1	43	24.02
2	136	75.98
ANC package (3 or more visits, 2 TT doses, Iron and folic acid tablet intake)		
Utilized	113	63.13
Not utilized	66	36.87

Table 3. Post natal details of study participants (n=179)

Post natal visits	Number	Percentage
1	42	23.46
2	83	46.37
≥3	54	30.17
Continuation of IFA and Calcium		
Yes	36	20.11
No	143	79.89
Family planning		
Yes	116	64.8
No	63	35.2
Advice on Breast feeding practices		
Yes	156	87.15
No	23	12.85
Advice on Postpartum exercises		
Yes	21	11.73
No	158	88.27
Advice on Nutrition		
Yes	76	42.46
No	103	57.54
PNC package (3 or more visits, Iron and folic acid tablet intake, Breast feeding & Nutrition education, Postpartum exercise, Family planning services)		
Utilized	32	17.88
Not utilized	147	82.12

Table. 5, depicts the association between maternal services utilization with literacy and socio economic status. Among the literates 84.07% had availed complete ANC package and 87.50% used PNC services. When socioeconomic class was considered, 68.14% and 62.50% of women belonging to class V had used ANC and PNC packages respectively. Among the class II women the utilization rates for ANC and PNC packages was 2.66% and 3.13% accordingly. This shows that literacy plays a role in utilization of the services. ($\chi^2=0.2279$, df=1, P value=0.6331, Not significant)

DISCUSSION

The present study was aimed in assessing the utilization patterns of complete ANC and PNC packages among women residing in urban slums. 63.13% of women had utilized full ANC package when compared PNC package which was only 17.88% (P<0.05). The reason for ample availment of PNC package was probably the focus of attention shifting towards the newborn after delivery and negligence in educating the mother regarding her health and her needs in postnatal period.

The present study showed that majority of women 54.75% were in the age group of 21-25 years. 57.54% women had completed high school education when compared to a study conducted in Mumbai by Singh pk et al², where in larger number of women belonged to less than 18 years of age and 48.5% of the participants were illiterates.

It was also found that 65.93% of the women had taken a minimum of 3 antenatal visits, and 87.15% of them had

Table 4. Comparison of ANC and PNC utilization among study participants (n=179)

ANC and PNC package					
ANC package			PNC package		Significance
(3 or more visits, 2 TT doses, IFA intake)			(3 or more visits, IFA intake, Breast feeding & nutrition education, postpartum exercise, Family planning services)		
Package Utilization	No.	%	No.	%	$\chi^2=76.05$, df=1 P<0.0001, Significant OR=7.86595 % CI=4.826 -12.82
Utilized	113	63.13	32	17.88	
Not utilized	66	36.87	147	82.12	

Table 5. Comparison of demographic characteristics with utilization among study participants

Demographic characteristics		Utilized				χ^2	df	p
		ANC package (n=113)		PNC package (n=32)				
Literacy status	No.	%	No.	%	0.2279	1	0.6331 Not Significant	
Literates	95	84.07	28	87.5				
Illiterates	18	15.93	4	12.5				
Socioeconomic status	No.	%	No.	%	χ^2	df	p	
Class II	3	2.66	1	3.13				
Class III	7	6.19	2	6.25				
Class IV	26	23.01	9	28.12				
Class V	77	68.14	20	62.5				

registered their pregnancy in first trimester when compared to a study done by Roy MP et al³ in Lucknow where 85.5% of the women had taken at least 3 antenatal visits and 53.7% had registered in first trimester.

In a study conducted at Belgaum, by Paudel DP et al¹, 61.3% of the women had taken at least 3 postnatal visits and 89% of them had continued intake of iron and folic acid consumption after delivery in contrast to the present study where only 30.17% and 20.11% women had availed more than 3 visits and continued intake of iron supplements respectively. This was probably because during the post natal period, mother considered concern of the newborn was most important and top priority rather than caring for herself and women thought that if they continued iron supplements in postnatal period it would cause gain in weight leading to further complications.

The present study also revealed that 68.14% and 62.50% of women belonging to lower socioeconomic status had utilized ANC and PNC services accordingly which was in contrast to a study conducted at Mumbai by Singh A et al¹⁰ wherein 54.8% women had taken ANC services and only 22.7% had received PNC services that constituted to the lower socioeconomic class of the society.

The maternal health services were utilized maximum by the literate women in the present study (more than 80%), accomplishing the fact that literacy had a significant role. However, women who constituted to higher socio economic class in the community had not utilized the packages adequately as these women were working and had registered at private hospitals wherein the waiting period at hospitals was one of the main reasons. The lower class group women had used the maternal services adequately as maximum had registered in government hospital and these packages were available to them free of cost and provided at their door steps by health care workers which also helped in saving their time.

Conclusion

The present study findings suggest that utilization of PNC services is very minimal as compared to ANC, which is influenced by factors like literacy, working status of women and socioeconomic status and thus, emphasizing the fact that these services are not adequately utilized irrespective of the availability and easy access to healthcare resources. Women should be sensitized regarding the importance of postnatal period so that they utilize the PNC services as effectively as ANC. This can be achieved by imparting health education, community participation and monitoring of activities undertaken by

health care workers. Strategies should be framed to focus on individual basis in the community and encouraging the beneficiaries to utilize the complete ANC and PNC packages.

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A community based assessment of quality of Diabetes care in the urban area of Tirupati, A.P.

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ABSTRACT

Abstract: Introduction: Diabetes is a significant cause of morbidity and mortality among middle aged adults in India. Diabetes management requires high level of comprehensive integrated care involving multiple stakeholders. The objective of the study is to assess the diabetes care by quality indicators and to determine the factors associated with it in Tirupati area, Andhra Pradesh. **Material and methods:** A cross-sectional study was carried out in the urban areas of Tirupati. A sample of 750 diabetic patients were selected by applying two stage cluster sampling method. The data was collected by using pre-designed and pre-tested questionnaire. **Results:** Only 4.7% of total diabetic subjects have received optimal quality of diabetes care. The proportion for each process indicator received by the subjects was annual dilated eye examination in 22.1%, annual foot examination in 8.1%, urine micro-albumin in 48.4%, HbA1C in 11.5% and lipid profile test in 27.2%. The intermediate outcome indicators of blood pressure and glycemic target were poorly controlled in more than half of them. The self-care practices of regular physical activity (35%), diet control (64%), foot care (79%), drug compliance (86%), self-monitoring of blood glucose (5.5%) and smoking cessation (51%) were observed. **Conclusion:** The quality of diabetes care is poor among the diabetic individuals in this area compared to the recommended guidelines. Barriers identified are related to both patient and health care delivery factors. A comprehensive health care delivery system is required to provide optimal care for diabetic individuals.

Key-words: Process indicators, intermediate outcome indicator, self-care.

INTRODUCTION

Diabetes mellitus is a group of metabolic diseases characterized by chronic hyperglycemia resulting from defects in insulin secretion or action or both, which in turn leads to disturbances of carbohydrate, fat and protein metabolism.¹ Over the past three decades the status of diabetes has changed from being considered as a disorder of elderly to one of the major causes of morbidity and mortality affecting the young and middle aged people.² Individuals diagnosed with diabetes are at increased risk of developing chronic complications which affect many organ systems such as retinopathy, neuropathy, nephropathy, cardiovascular disease and foot ulceration. According to WHO global health estimates, diabetes is ranked within the ten leading causes of deaths by contributing to 2.8 percent of total deaths³ and is one of the leading cause of years lost due to disability and DALYs in middle and high-income countries.⁴ In India, type 2 diabetes mellitus has been rising rapidly, with more than 62 million diabetics, the country being labelled as the diabetes capital of the world.

Diabetes management requires high level of comprehensive quality care involving multiple

stakeholders. Worldwide, the quality of care for patients with diabetes has been shown to be variable and suboptimal. Despite of its high prevalence, serious long-term complications, and established evidence-based guidelines for management, translation of recommendations to practice of care is still deficient in many countries.^{5,6} The present study was conducted to generate population based data for the quality of diabetes care based on guidelines, as fewer such studies were conducted in this area.

MATERIAL & METHODS

A cross sectional study was conducted in the urban area of Tirupati, Andhra Pradesh from June 2015 to December 2015 to assess the quality of care among type 2 diabetic individuals who have been diagnosed with the condition at least one year before at the time of study. Those who has not given the consent and those seriously ill patients were excluded from the study. The sample size (n=750) was calculated by assuming a prevalence of optimal care for diabetes as 50% with allowable error of 5% and is adjusted for design effect of 1.5 and a response rate of 80%. The required sample was drawn by applying two

stage cluster sampling method. The areas/localities in all the wards of Tirupati are taken as clusters. From the 54 clusters enlisted, 21 clusters were selected in the first stage by probability proportionate to size sampling method. In each area/cluster, the eligible diabetic individuals were enlisted by house to house survey and 36 individuals were selected for interview by simple random sampling in second stage. During the house to house survey, if two diabetic individuals were found in the same house, the person with the lesser duration of diabetes was selected.

Ethical clearance was obtained from institutional ethical committee, Sri Venkateswara Medical College and informed written consent was taken from the study subjects after explaining the purpose of the study. The data was collected from the subjects both by oral interview and by checking the medical reports by using pre-designed and pre-tested questionnaire. Physical measurements of height, weight, waist circumference and blood pressure were recorded by using standardized methods and instruments. The weight of the subject was recorded with weighing machine with light clothing. The height was recorded with stadiometre and waist circumference was measured with non-stretchable measuring tape at the mid-point between lower margin of rib cage and upper border of iliac crest at the level of umbilicus to the nearest 0.1 cm. The blood pressure was measured in sitting position when the patient is comfortable by using standardised sphygmomanometer and stethoscope.

National diabetes quality improvement alliance (NDQIA) indicators were used to assess the diabetes quality of care received by patients.^{7,8} Indian Council of Medical Research (ICMR) guidelines⁹ for management of diabetes are also comparable to these recommendations. Each indicator was given a score of 1 (maximum score 8) and a total score of 5 and more is considered as optimal care, a score of 3-5 is suboptimal and score of less than 3 is considered as poor care. The data was entered in Microsoft excel and the results were analyzed using SPSS 21 version.

RESULTS

Of the total subjects, 46.1% were males and 53.9% were females. Majority of the subjects belong to the age group of 45-55 years (30.7%), followed by 55-65 years (29.5%), more than 65 years (21.3%) and 35-45 years (18.5%). Majority were Hindus (83%). Illiterates/primary school subjects were 48%, middle/high school subjects were 29%, intermediate/diploma were 11.3% and graduate/postgraduates were 11.7%. Based on BG Prasad socioeconomic classification, 25.5 % of subjects belong to upper class, 38.8% were upper middle, 27% were middle class, 7.7% were lower middle class and 1% belong to lower class. Among the total, 82.8% were married.

Table 1: Distribution of subjects based on disease related variables.

Variable	Male n=346 (%)	Female n=404 (%)	Total n=750 (%)
Duration of diabetes			
≤ 4	115 (33.2)	164 (40.6)	279 (37.2)
05-08	79 (22.8)	100 (24.8)	179 (23.9)
09-12	62 (17.9)	76 (18.8)	138 (18.4)
13-16	66 (19.0)	41(10.2)	107 (14.3)
≥ 17	24 (7.0)	23 (5.6)	47 (6.2)
Health care facility			
Government tertiary hospital	29 (8.4)	36 (9.0)	65 (8.7)
Corporate tertiary hospital	48 (14.0)	36 (9.0)	84 (11.2)
Private diabetologist	213 (61.5)	263 (65.0)	476 (63.4)
Private general practitioner	25 (7.2)	34 (8.4)	59 (7.9)
Urban health centre	29 (8.4)	31 (7.6)	60 (8.0)
Ayurvedic hospital	2 (0.5)	2 (0.5)	4 (0.5)
Homeopathy hospital	0	2 (0.5)	2 (0.3)
Type of treatment taking			
Oral hypoglycemic drugs	272 (78.6)	317 (78.5)	589 (78.5)
Insulin	28 (8.0)	9 (2.2)	37 (4.9)
Insulin & Oral drugs	39 (11.4)	73 (18.0)	112 (15)
Ayurveda	5 (1.5)	2 (0.5)	7 (1.0)
Homeopathy	2 (0.5)	2 (0.5)	4 (0.5)
Others	0	1 (0.3)	1 (0.1)
Hypertension			
Yes	187 (54)	235 (58.2)	422 (56.3)
No	159 (46)	169 (41.8)	328 (43.7)
Total	346 (100)	404 (100)	750 (100)

Table 2: Distribution of Self-care practices among subjects

Self-care practices	Male n=346 (%)	Female n=404 (%)	Total n=750 (%)
Diet plan	198 (57.2)	285 (70.5)	483 (64.4)
Physical activity	171 (49.4)	90 (22.3)	260 (34.7)
Drug compliance	293 (84.7)	354 (87.6)	646 (86.1)
Self monitoring of blood glucose	26 (7.5)	15 (3.7)	41 (5.5)
Foot care	284 (82.1)	307 (76.0)	592 (79.0)
Regular monitoring of blood glucose	169 (48.8)	228 (56.4)	397 (53.0)

Table.1 shows the distribution of subjects according to variables related to diabetes. The majority of subjects were of lesser diabetes duration (<8 years). The majority (63.5%) were seeking private diabetologist for their regular check-ups. Oral hypoglycemic drugs were the mainstay of treatment for 78% of the subjects. Insulin requirement increased with increase in duration of

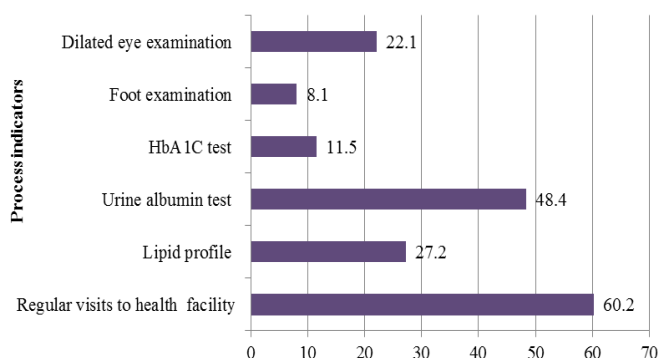
diabetes ($p<0.001$). The family history of diabetes was observed in 38% of subjects. The most common condition found with diabetes was hypertension (in 56.3%) followed by hypothyroidism (6%) and respiratory illness (5%).

The knowledge regarding diabetes condition and care among the study subjects was assessed by a set of questions. The knowledge score was good (9-12) in 31%, average (5-8) in 62.6% and poor (0-4) in 6.4% of subjects.

Table 3: Distribution of subjects based on risk factors.

Variable	Male (n=346) (%)	Female (n=404) (%)	Total (n=750) (%)
Body mass index			
Underweight	24 (7.0)	0 (0)	24 (3.2)
Normal	124 (35.8)	119 (29.4)	243 (32.4)
Overweight	146 (42.3)	149 (36.9)	295 (39.3)
Obesity stage 1	43 (12.4)	107 (26.5)	150 (20.0)
Obesity stage 2	5 (1.4)	24 (6.0)	29 (3.9)
Obesity stage 3	4 (1.1)	5 (1.2)	9 (1.2)
Abdominal obesity			
Present	131 (37.8)	321 (79.5)	452 (60.3)
Absent	215 (62.2)	83 (20.5)	298 (39.8)
Smoking			
Non-smokers	173 (50.1)	404 (100.0)	577 (77.0)
Former smokers	93 (26.9)	0 (0)	93 (12.4)
Current smokers	80 (22.9)	0 (0)	80 (10.6)
Total	346 (100)	404 (100)	750 (100)

Fig 1: Proportion of subjects receiving recommended care process indicators



Self-care practices among the subjects (Table. 2) were found to be proper diet plan (64.4%), regular physical activity (34.7%), self-monitoring of blood glucose (5.5%), drug compliance (86%) and foot care (78.9%). The body mass index (BMI) was found to be overweight in 39.3% and obese in 25.1% of subjects. Abdominal obesity (WHR >1 in males and > 0.85 in females) was found in 60% of subjects. Among the males, 23% are

currently smoking and 27% were former smokers. (Shown in Table.3)

Table 4: Association of quality of care with relevant variables

Variable	Quality of diabetes care				Significance
	Optimal	Sub-Optimal	Poor	Total	
Gender					
Male	15	67	265	346	$\chi^2=0.17$
Female	20	78	305	404	p=0.9;NS
Age group (years)					
35-45	5	19	115	139	
45-55	19	54	157	230	$\chi^2=27.3$
55-65	2	52	167	221	p=0.000;S
>65	9	20	131	160	
Education					
Illiterate/primaryschool	14	70	276	360	
Middle/high school	9	36	172	217	$\chi^2=19.9$
Intermediate/diploma	2	20	63	85	p=0.003;S
Graduate/postgraduate	10	18	60	88	
Socioeconomic class					
Upper	24	44	123	191	
Upper middle	5	55	231	291	$\chi^2=48$
Middle	6	41	155	202	p=0.000;S
Lower middle	0	5	53	58	
Lower	0	0	8	8	
Duration of diabetes					
≤ 4	9	38	232	279	
05-08	13	24	142	179	$\chi^2=31.6$
09-12	7	35	96	138	p=0.000;S
13-16	5	33	69	107	
≥ 17	1	15	31	47	
Health care facility					
Govt tertiary hospital	0	14	51	65	
Corporate tertiary hospital	16	32	36	84	$\chi^2=98.6$
Private diabetologist	19	102	355	476	p=0.000;S
Private general practitioner	0	4	55	59	
Urban health centre&others	0	0	66	66	
Type of treatment					
Insulin user	7	59	83	149	$\chi^2=49.6$
Non-insulin users	28	86	487	601	p=0.000;S
Diabetes knowledge score					
Good	19	73	140	232	
Average	15	70	385	470	$\chi^2=48.7$
Poor	1	2	45	48	p=0.000;S
Total	35	145	570	750	

Quality of care indicators

Process indicators

Among the study subjects during the past year, the urine albumin test was done in 48.4% of subjects, lipid profile (LDL cholesterol) was tested in 27.2%, dilated eye examination was recorded in 22.1%, HbA1C was tested in 11.5% and foot examination was done in only 8.1%. Among them, 60% were regularly visiting the health care facility for follow-up. Fig.1.

Outcome indicators:

The intermediate outcome indicators of blood pressure and glycemic control were measured among the study subjects. The blood pressure was in recommended range (<140/90 mm hg) among 48.5% of subjects. The glycemic control (PPBS <180mg/dl) was satisfactory in only 28% of them.

Overall, the subjects who received optimal care (≥ 5 score) was only 4.7%. In the remaining, the diabetes care was suboptimal in 19.3% and poor in 76%.

Dilated eye examination was found to be significantly associated with duration of diabetes ($p=0.001$), type of health facility ($p=0.0001$), type of treatment ($p=0.004$) and with the diabetes knowledge score ($p=0.0001$) among subjects. No association was found with gender ($p=0.58$), age ($p=0.45$), education ($p=0.46$) and socioeconomic status ($p=0.41$) of the individual.

Urine albumin testing was significantly associated with age group ($p=0.0001$), type of health facility ($p=0.0001$), type of treatment taking ($p=0.0001$), and knowledge score ($p=0.0001$) of subjects. There was no association found with gender ($p=0.7$), education ($p=0.2$), socioeconomic status ($p=0.06$) and duration of diabetes ($p=0.13$).

Foot examination has been found to be significantly associated with age group ($p=0.02$), socioeconomic status ($p=0.004$), type of health facility ($p=0.001$) where subjects are seeking care. While no such association was found with gender ($p=0.14$), education (0.28), duration of diabetes ($p=0.2$), type of treatment (0.17) and knowledge score of diabetes ($p=0.23$).

The variables which were significantly associated with testing of HbA1C are education status of subjects ($p=0.0001$), socioeconomic status ($p=0.001$), duration of diabetes ($p=0.025$), type of health facility ($p=0.0001$) and knowledge score of individual ($p=0.0001$).

Lipid profile checkup was associated with education ($p=0.02$), socioeconomic status ($p=0.001$), type of health facility ($p=0.0001$) and knowledge score ($p=0.0001$). No association was found with age ($p=0.09$), gender ($p=0.33$) and duration of diabetes ($p=0.29$).

Table. 4 shows the association of quality of care with socio demographic and disease related variables. Factors of socioeconomic status ($p=0.001$), health care facility

type ($p=0.000$), knowledge score ($p=0.000$) and duration of diabetes ($p=0.001$) are significantly associated with quality of diabetes care among the study subjects even after adjusting.

DISCUSSION

This study documented the poor quality of care among diabetic individuals in Tirupati which is one of the densely populated urban area in Andhra Pradesh. Only ~5% of subjects have received optimal care for diabetes. Few hospital based studies have depicted the suboptimal quality of care, nevertheless, this is the first population based study conducted in South India region to assess the diabetes care.

The prevention of micro and macro vascular complications of diabetes demands a high level of quality care. Guidelines have been framed for management and monitoring of diabetes by various associations like American Diabetes Association and ICMR etc. In developing countries like India where the health care system is overburdened with maternal and child health care and communicable diseases, the diabetes care is often shown to be suboptimal.²

The proportion of diabetic individuals who have received the dilated eye examination in the past year of this study was 22.1%. It was, 16.2% in Nagpal et al., study done among the urban diabetics in Delhi (DEDICOM),¹⁰ 28.5% in a secondary care hospital based study¹¹ and 56.8% in the tertiary care hospital study⁴ conducted in South India. The number of subjects who received at least one dilated eye examination ever since diagnosis of diabetes is remarkably low against the recommendation of dilated eye examination immediately after diagnosis.

The urine micro albumin test is the popular process indicator received by higher proportion of subjects (48%) which is similar to the Nagpal et al., study¹⁰ in Delhi where half of the subjects had routine urine testing in the past year. While 8.1% of subjects received foot examination in this study, Nagpal et al., study reported only 3.1%.¹⁰ None of the patients have received foot examination in the tertiary care hospital study in Bangalore.⁵

The finding for HbA1C testing (11.5%) is comparable to the finding in those studies done in Delhi (13%) and an urban health centre audit¹¹ in south India (15.5%). It was reported to be 40% in Bangalore hospital based study.⁵ The serum LDL cholesterol check-up was done in 27% of subjects in last one year in this study while it was 32% and 34% in Nagpal et al., study¹⁰ and Badawi et al., study¹² respectively.

Hypertension is a condition itself responsible and also a risk factor in diabetes for development of long-term complications. Blood pressure control is an important goal in diabetes management to prevent complications.⁶ Unfortunately, more than half (51.5%) of study subjects have poor blood pressure control (SBP >140 mm hg and

DBP >90 mmHg). Similarly in Delhi diabetes community survey,¹⁰ 63% of diabetic patients had uncontrolled hypertension. The glycemic control was poor in 72% of subjects. Only 28% of subjects were found to have good glycemic control which is similar to Ramachandran et al., study¹³ (29%). The Delhi survey has reported 42% of poor glycemic control (HbA1C >8%).

Diabetes self-management education was proven to play a role in reducing complications through various studies by improving diabetes awareness and self-care practices among the patients.^{14,15} In this study, 35% of subjects were following advice on regular physical activity. Self-monitoring of blood glucose was being practiced only by 5% of study subjects. Adherence to advice on diet plan, medication and foot care was seen in more than two thirds of subjects. Similar results were observed in Gopichandran V et al., study¹⁶ and Padma K study¹⁷ in South India. Higher BMI (>25 kg/m²) was seen in 64% and abdominal obesity in 60% of subjects in this study similar to Ramachandran et al study¹³ whereas DEDICOM survey¹⁰ in Delhi has reported relatively higher proportions (75% & 89%). While 23% of males were currently smoking in this study, 19% were current smokers in DEDICOM survey.¹⁰ Out of the total, 40% of the subjects have not visited the health care facility in last 6 months, while 22% of subjects were not monitoring their blood glucose levels regularly (recent 3 months).

Conclusion

The quality of diabetes care is poor among the study subjects both in terms of process and outcome (intermediate) indicators. Though guidelines are available to monitor the diabetes so as to prevent and detect complications early, the practical application of these guidelines is very poor. The self-care practices among the subjects are also not satisfactory. Several factors related to patient, health care system and provider are identified as barriers for the implementation of these recommendations. A comprehensive and integrated system of health care with regular audit can improve the quality of care being provided to diabetic individuals in India.

Limitations

The indicators list used in this study to assess quality of care is inclusive but not exhaustive. The glycemic control is recommended to assess with HbA1C, but due to cost/logistics reasons postprandial blood glucose level was measured in this study. The factors which are associated with diabetes care are multiple and complex. In this study, some of the feasible variables were studied.

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Do medical students enjoy a good Quality of Life? A Cross-Sectional Survey

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ABSTRACT

Background: Quality of life is defined as individual perception of well-being, within one's socio-cultural context or the satisfactory fulfilment of desires and pleasures that would lead to the accomplishments of their perception. This study was carried out to determine the level of such satisfaction among medical students. **Participants and Methods:** In this cross-sectional study, one hundred twenty-five students were invited to participate in the study being chosen through stratified random sampling. Twenty-five students from each the five classes of Gujranwala Medical School, Gujranwala, Pakistan, were invited. One hundred students completed the proforma containing WHOQOL-BREF questionnaire and socio-demographic characteristics. **Results:** According to the perception and response of the students, only one percent students had a very poor quality of life. 57% students were of the view that they have a good quality of life and 29% have answered the questionnaire indicating a very good quality of life in all four domains of WHOQOL-BREF. There was no significant effect of gender, year of study and living with family status on quality of life. **Conclusion:** This study demonstrates that the majority of the medical students have a good quality of life while a negligible number of them have a poor or very poor quality of life. Students are especially more satisfied with their physical health when compared with other domains of life and as usually observed, majority of them rarely have feelings of anxiety, depression and despair.

Key-words: Quality of Life, Medical students, Depression, Anxiety, Physical health.

INTRODUCTION

Quality of life is the general well-being of individuals and societies. Life as a medical student poses particular challenges and stress that have an impact on quality of life due to heavy academic workload⁽¹⁻³⁾. It is a result of interplay among social health, physical and psychological development during their academic session⁽⁴⁻⁶⁾. Mental problems such as stress, anxiety, depression and impaired cognitive ability have been described among medical students and are associated with their academic and professional performance⁽⁷⁻¹⁰⁾.

General wellbeing encompasses the assessment and control of environmental factors that have a potential to impact individual behaviors which can potentially affect the quality of life. It also refers to the ability of a student to adapt comfortably to different social situations and act appropriately in a variety of settings during academic life^(10,11). Several studies have assessed the quality of life among medical students. A general notation is that the medical students encounter higher level of stress, which undermines their quality of life. However, students who demonstrate a higher ability for resilience have a better quality of life due to their ability to adjust and incorporate a better perspective and coping strategies to overcome stress⁽²⁾. Medical students experience lower quality of life

when compared with the general population that reflects on their overall outlook and academic achievements. It also has a negative impact on the society as well⁽¹²⁾.

Local data considering the quality of life of the medical students of the public Pakistani colleges are scarce. Therefore, the current study was undertaken to assess quality of life among medical students and to explore the influencing factors at of such colleges; Gujranwala Medical School, Gujranwala, Pakistan.

PARTICIPANTS & METHODS

This cross-sectional survey carried out in the period between November 2015 to December 2016. The sample size was calculated considering the rate of the expected poor quality of life among medical students of about 10% that gave rise to a sample size of 97 at 6% margin of error at 95% confidence level. Stratified random sampling technique was applied. Study Population and setting: Gujranwala Medical School, Gujranwala, Pakistan, with a total number of students in the five classes of MBBS of 475. A self-administered proforma containing World Health Organization Quality of Life (WHOQOL-BREF) was used as data collection tool. It contained questions regarding all four domains of life, i.e., physical,

psychological, social and environmental domains. Data collection procedure and analysis: After approval from local ethical committee, an informed consent was taken from selected students. From each of five classes, 25 students were invited to participate in the study after random selection. One hundred students completed the proforma correctly. A Likert scale for answering was given and scored according to instructions of WHOQOL-BREF.

Data was analyzed using Statistical Package for Social sciences (SPSS) version 19.0. Categorical data like gender, year of study were presented as frequencies and percentages. Summarized quality of life results (as good, neutral and poor) were cross-tabulated for gender, year of study (first three years as preclinical and last two years as clinical) and their residential status (living with family or not). Fischer exact test was applied to compare the difference. A p value <0.05 was taken as significant.

RESULTS

One hundred students filled the questionnaire completely. The mean age of respondents was 22 years ranging from 19 to 24 years. Among sampled population, 25 students were male and 75 were female. Eleven students (11%) were living with their family while rest were in boarding/hostel. Only two students were of the view that they have a poor quality of life overall. Twelve students remained neutral in responding to overall quality of life, i.e. neither good nor bad. The responses of the sampled population in four domains defining the quality of life, i.e., physical, psychological, social and environmental domains were tabulated.

In the physical domain, we found that 10% of the students were dissatisfied with their physical health while 67% of the students were satisfied. 18% of the students were dissatisfied with their sleeping habits, 14% of the students were dissatisfied with their ability to perform while 69% were satisfied, 13% of the students were dissatisfied with their capacity to work while 77% were satisfied. In the social domain 5% of students reported dissatisfaction regarding their personal relationship, 6% were dissatisfied with the condition of living, 6% of students were dissatisfied with their support from friends. Nonetheless, majority of students enjoyed a good social life.

In the psychological domain, students were asked about negative feelings such as mood changes, anxiety, depression, despair etc. 44% of them are of the view that they never encountered such feelings, 35% of them had reported that they experience such feelings rarely and 24% often are disturbed by such feelings. Among sampled students, 40% students responded that after entering the medical profession there has been a little increase in their stress level, 42% felt a moderate increase, and 18% felt that there has been an extreme stress after entering medical school. 40% of students felt that they have more load than their capacity to work while 41% felt that there has been a moderate increase in

academic load, 19% experienced an extreme increase in academic load with respect to their capacity.

Table 1: Simplified answers to questions in different domains of life (n = 100).

	Statements	Dissatisfied	neutral	Satisfied
Physical domain	How much are you satisfied with your health?	16	17	67
	How satisfied are you with sleep?	18	15	67
	How satisfied are you with your ability to perform?	14	17	69
	How satisfy are you with your capacity to work?	13	10	77
Social domain	How satisfy are you with your personal relationships?	5	18	77
	How satisfy are you with your condition of living?	6	21	73
	How satisfy are you with your support from your friends?	6	10	84
		Never	seldom	Often
Psychological domain	How often do you have negative feelings like mood changes anxiety depression and despair?	44	35	21
		Little	Moderate	Extreme
	How much do you feel your stress have been increased?	40	42	18
	How much do you feel that academic load is greater than your capacity?	40	41	19
Environmental domain		Little	Moderate	Extreme
	How healthy is your physical environment?	28	49	23
	To what extent do you have opportunity for leisure activity?	16	34	50
	How well are you able to get around?	15	98	37

In consideration to the academic and social environment of medical students; some questions were also included in the questionnaire such as, how healthy is their physical environment; 28% were of the view that physical environment is a somewhat healthy, 49% answered that the environment is moderately healthy while, 23% felt that the environment is extremely healthy. 16% of medical students felt that they have little opportunity for leisure activity, 34% felt that they have moderate opportunity for leisure activity and 50% reported that they have significant opportunities. 15% of medical students felt that they have little opportunity to get around, 48% felt that they have moderate opportunity and 37% felt that they have significant opportunity to get around (Table 1).

Table 2: Effects of sociodemographic characteristics on quality of life among medical students (n = 100).

Quality of life	Good	Neutral	Poor	P value
Male	20	4	1	0.40*
Female	66	8	1	
Hosteller	77	10	2	0.70*
Day scholar	9	2	0	
Preclinical	50	8	2	0.59*
Clinical	36	4	0	

* Nonsignificant using Fischer exact test

DISCUSSION

The present study was designed to assess the general quality of life (QoL) of medical students using the WHOQOL-BREF index. In this era of extreme competition, the general health of an individual is extremely compromised; this is also true for the medical students, who have to deal with high academic workload, stress and demanding medical environment, impacting their overall wellbeing. Medicine being a significant tough profession has impact, not only on physical and physiological health of individuals but also on the environmental and behavioral patterns. Various studies have been done in the past to confirm this association. Some studies have shown that the negative effects and feelings of depression increase as the students go to higher classes^(4,5, 13,14), whereas according to our study 44% of the students reported that they did not experience negative feeling while 35% seldom had such feelings. According to another study frequency of symptoms of depression increase in direct proportion to the duration of time spend in this profession. Higher ranks in profession, prolonged the stress and perfectionist type of personalities predispose medical practitioners to mental illness⁽¹⁵⁻¹⁷⁾. In another study the earned score of students in social domain was at least 6.4 and at most 20 (mean = 13.7 and SE = 0.20). The score of students in environmental domain was between 5.5 and 20 (mean = 13.1 and SE = 0.16). No significant difference was seen between the female and male students in terms of environmental health level⁽³⁾. Similarly, in our study, there was no significant effect of gender, year of study and living with family status on quality of life (Table II).

Overall, in this study, the students' QoL are good in two areas, namely environmental and psychological health, and poor in physical health and social relationships. Our data indicates that as the student go higher in the levels starting years 1 to 5 of their medical training, the QoL decreases, spanning all four domains of analysis. Some studies have also reported that, internship level is of a crucial position as the QoL in this stage reaches to its lowest level⁽³⁾.

The present study demonstrated that majority of students have a general good quality of life; this is mostly influenced by a good quality of life in social domain. Secondly, a satisfactory quality of life with respect to

environmental domain was also observed. Though, the personal relationships and physical health are the domains which are observed to be the least in terms of QoL. However, considering the overall average we conclude that the medical students experience a good quality of life as per the WHOQOL.

Conclusion

It is concluded that majority of the medical students enjoys a good Quality of life in public sector medical college of Pakistan. Medical students were found more satisfied with their physical health when compared with other domains. Limitations of the current study include single center study and smaller sample size. Further studies should be done to compare the medical students' quality of life with general population or with the students of other professions.

Limitations of the Study

Limitations include a single center study with relatively small sample size. The student distribution is female dominant because of their relative proportion in the medical college.

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Does Type II Diabetics compromise QOL among Rural Elderly? A community Based Cross sectional study in Rural Bangalore

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ABSTRACT

Background: According to WHO, Population aging is happening very quickly.¹WHO defines QOL as ‘Individual’s perception of their position in life in context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns’.³The objectives of present study were to find out prevalence of type 2 Diabetes among elderly, to assess Quality of life (QOL) and assess factors affecting QOL among elderly Type II Diabetics. Materials and methods: It is a community based cross sectional study carried in the field practice area of MVJ Medical College and Research Hospital, Bangalore for a period of 9 months. Sample size calculated was 230 and snowball technique was used. Data collected using semi structured questionnaire and QOL was assessed using WHO QOL OLD Questionnaire after informed consent. Data were entered in Microsoft excel and analyzed using SPSS v22. To compare between various groups, independent t test was applied. Results: Among 231 study participants, 122 (48.8%) belonged to 60-65 years age group, 126 (54.5%) were females, 130(56.3%) were illiterates and 119 (51.6%) were completely dependent financially on family members, 89(38.5%) were having Diabetes mellitus. Statistically significant difference was found in SAB(Sensory Abilities) and DAD(Dead and Dying) domain where Non-Diabetics had higher scores. Conclusion: Old age itself compromises QOL which is added with burden of Type II Diabetes among this age group.

Key-words: Old age, QOL, Elderly, Diabetics

INTRODUCTION

Aging is normal and physiological process. Population aging is shift in age distribution of a population towards older age. Population aging has been growing concern to both developed and developing countries. According to WHO, Population aging is happening very quickly moving from 12 percent to 22 percent globally.¹India has witnessed this demographic transition and reached demographic aging attributed to higher reduction in mortality, better educational status, decline in fertility and better health care facilities. This elderly age group is vulnerable to medical problems like impairment of special sensory functions like vision and hearing, impaired physical mobility, more prone for non – communicable diseases, psychological impairment because of lack of family support, economic insecurity, social isolation and elderly physical abuse contributed with rapid urbanization, modernization, upward trends of nuclear family and decreasing family traditions.²

World Health Organization (WHO) defines Quality of Life (QOL) as Individual’s perception of their position in life in context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns”.³ The quality of life of elderly people has become relevant with the

demographic shift and quality of life should include factors other than health.⁴The concept of quality of life encompasses satisfaction and wellbeing, containing subjective and multi-dimensional characteristics.⁵Of all the diseases, type 2 diabetes mellitus (T2DM) is the single most disease affecting a large number of elderly populations. The prevalence of type II Diabetes mellitus is increasing in alarming rate and it is also becoming a huge epidemic of social, economic, physical and emotional burden. DM in elderly includes two groups which are “survivors” of young or middle age onset of diabetes and incident diabetes in older age or type 2 DM.⁶ Elderly patients with diabetes have a higher incidence of depression and impaired cognitive function when compared with age-matched controls without diabetes.⁷ Diabetes and its complications take a major toll on the quality of life of the elderly and the healthcare costs of the society. The management of diabetes in elderly requires special care and attention.⁸ With this above back ground, the study was started with the objective to find out prevalence of Type II Diabetes among elderly, to assess Quality of life (QOL) among Type II Diabetes in elderly and assess factors affecting QOL among same participants.

MATERIAL AND METHOD

It is a community based cross sectional study done in UHTC, field practice area MVJ Medical College and Research Hospital, Hoskote, Bangalore Rural for a period of 9 months from August 2017 to March 2018. Sample size calculation considering the expected Standard Deviation (SD) of QOL score in the elderly population⁹ to be 10.88 and tolerable error 1.5% at 95% confidence interval, the minimum sample size came out to be 201 by the formula $(1.96^2 \sigma^2 l^2 / e^2)$, where 'σ' is standard deviation and 'l' is allowable error. Taking 10 % as non-response rate, the final sample size was calculated as 230. Sampling technique was snowball technique. Data regarding socio-demographic profile and morbidity status was collected using semi structured questionnaire and QOL will be assessed using WHO QOL OLD (WHO Quality of Life –OLD) Questionnaire after informed consent by interview technique. The questionnaire has 24 questions and evaluates 6 domains which are SAB, AUT, PPF, SOP, DAD & INT. *Sensory Abilities (SAB)* means Sensory functioning, impact of loss of sensory abilities on quality of life, *Autonomy (AUT)* means Independence in old age; being able or free to live autonomously and to take own decisions, *Past, Present and Future Activities (PPF)* Satisfaction about achievements in life and at things to look forward to, *Social Participation (SOP)* means Participation in activities of daily living, especially in the community, *Death and Dying (DAD)* means Concerns, worries and fears about death and dying, *Intimacy (INT)* being able to have personal and intimate relationships. *Summing* the items belonging to a facet yields the *raw facet score (RFS)*. To obtain the transformed facet score (0 - 100) the following transformation rule can be applied: $TFS = 6.25 \times (RFS - 4)$. *Basically* high scores represent high quality of life, low scores represent low quality of life; For positively worded items, the above classification can be applied in which higher values represent a higher quality of life. For negatively worded items, the score has to be recoded. Permission was taken from World Health Organization (WHO) for the use of WHO QOL OLD Questionnaire. All those aged above 60 years were included in the study and those with other morbidities, chronically sick and beds ridden were excluded from the study. Few operational definitions were made. Participants were grouped under married and others, where others included separated, widow, widower and not leaving together. Financial status were defined into three categories which included Financial dependent who were completely dependent on family members, Financially independent who live on their own savings and pension amount without the help of other family members and partial dependent who had both pension amount and also depended on family members. Data entered in Microsoft excel and analyzed using SPSS v22. Level of significance will be defined with p value less than 0.05. To compare between various group, independent t test was applied.

Table 1: Distribution of study participants according to Socio demographic profile of study participants

Sl no	Variables	N=231
1	Age in years	60- 65 122 (48.8%)
		66-70 53 (21.2%)
		71-75 31(12.4%)
		75- 80 14 (5.6%)
2	Gender	80 and above 30 (12%)
		Male 105 (45.5%)
3	Education	Female 126 (54.5%)
		Literate 101 (43.7%)
4	Financial dependency	Illiterate 130 (56.3%)
		partially dependent 50 (21.6%)
5	Marital Status	completely dependent 119 (51.6%)
		completely independent 62 (26.8%)
		married 119(51.6%)
		others 112(48.4%)

Table 2: Distribution of Diabetes mellitus study participants according to their morbidity profile

Diabetes mellitus (n=231)	present	89(38.5%)
	absent	142(61.5%)
Among Diabetes Mellitus(n= 89)		
Drug regimen	OHA	70(78.5 %)
	Insulin	16(18 %)
	Combination	3(3.5)
Family history of Diabetes mellitus	present	59(66.3 %)
	absent	30(33.7 %)
Duration of disease	less than one year	11(12.4%)
	1 to 5 years	41(46.1%)
	6 to 10 years	27(30.3%)
	11 years and above	10(11.2%)

Table 3: Comparison of QOL among Diabetics and Non Diabetics

	DM	n	Mean (Std. deviation)	p value*	TFS	P value*
SAB	present	89	13.6 ± 2.2	0.01	60.3±13.8	0.01
	absent	142	16.0 ± 2.3		75.1±14.8	
AUT	present	89	14.4 ± 3.0	0.36	65.5±18.8	0.36
	absent	142	14.1 ± 3.1		63.16±19.4	
PPF	present	89	14.5 ± 2.3	0.78	66.0±14.8	0.78
	absent	142	14.4 ± 1.9		65.5±12.3	
SOP	present	89	13.3 ± 3.0	0.54	58.35±18.9	0.54
	absent	142	13.5 ± 2.6		59.8±16.8	
DAD	present	89	13.3 ± 1.9	0.01	58.7±12.3	0.01
	absent	142	16.3 ± 2.6		77.4±16.5	
INT	present	89	15.5 ± 2.5	0.24	72.1±15.7	0.24
	absent	142	15.9 ± 2.4		74.5±15.5	
TOT	present	89	84.9±10.06	0.01		

Independent t test

Table 4: Comparison of various factors among Diabetics

		SAB	AUT	PPF	SOP	DAD	INT
Gender	male	61.3±12.5	66.1±20.2	68.1±12.4	55.6±18.8	60.7±13.0	70.3±16.5
	female	59.3±15	64.9±17.7	64 ±16.6	60.8±18.9	61.1±4	73.3±14.9
	# p value	0.5	0.7	0.2	0.19	0.13	0.3
Education	literate	61.2±14.8	68.8±18.6	69.8±14.3	60.1±17.6	59.0±12.9	74.0±17.2
	illiterate	59.3±12.8	62.07±18.6	62.2±14.4	56.6±17.7	58.3±11.8	70.1±13.9
	# p value	0.5	0.08	0.01	0.4	0.8	0.25
Marital status	married	61.6±13.7	66.5±19.1	67.0±14.7	59.5±18.8	58.6±12.4	73.5±15.0
	separated	53.1±12.4	59.8±16.9	61.1±14.7	51.7±18.5	58.9±12.1	64.7±17.7
	# p value	0.03	0.2	0.01	0.015	0.9	0.04
Age	less than 65 yrs	61.4±15.8	69.0±19.4	66.9±15.7	61.8±19.1	57.0±12.0	76.3±14.2
	more than 65 yrs	58.9±11.1	61.4±17.5	65.0±13.7	54.4±18.8	60.6±12.5	67.2±16.1
	# p value	0.39	0.04	0.56	0.06	0.16	0.006

Independent t test

Among 231 study participants, 122 (48.8%) belonged to 60-65 years age group, 126 (54.5%) were females, 130(56.3%) were illiterates and 119 (51.6%) were completely dependent financially on family members. (Table 1)

Among 231 study participants, 89(38.5%) were having Diabetes mellitus. Among 89 diabetic participants, 70 (78.5%) were on Oral Hypoglycemic agents, 59(66.3%) had family history of Diabetes mellitus and 41(46.1%) had duration of 1-5 years.(Table 2)

Above table shows the six facets of quality of life among the study population with those Diabetics and non-diabetics. Above table shows the six facets of quality of life, viz. “sensory abilities (OLD – SAB)”, “autonomy (OLD – AUT)”, past, present and future activities (OLD –

PPF)”, “social participation (OLD – SOP)”, “death and dying (OLD - DAD)” & “intimacy (OLD - INT)” and the transformed total QOL scores (TTS) among the study population. Statistically significant difference was found in SAB and DAD domain where Non-Diabetics had higher scores.(Table 3)

Above table shows the comparison among Diabetics. Among Diabetics, Male diabetics had higher scores in SAB, AUT, PPF and female diabetics had higher scores in SOP,DAD, INT scores however difference was not statistically significant. Literate Diabetics had higher scores in all domains however statistically significant difference was seen in AUT & PPF domain compared to Non literates. Married Diabetics had higher scores compared to unmarried/divorced/separated with SAB, PPF, SOP and INT domains where statistically significant difference was noted. (Table 4)

DISCUSSION

The present study being a cross sectional community based study done on 231 participants following interview technique among old age with objective to assess Quality of life among elderly diabetics and assess factors affecting QOL using WHO-QOL OLD

questionnaire. Among 231 study participants, 122 (48.8%) belonged to 60-65 years age group, 126(54.5%) were females, 130(56.3%) were illiterates and 119 (51.6%) were completely dependent financially on family members.

The present study showed 89(38.5%) were already diagnosed with Diabetes mellitus. Study done by Jain A and Paranjape S in NEERI India showed 30.4% prevalence of Type II Diabetics among elderly which is similar to the present study.⁸The present study showed statistically significant difference in SAB(Sensory abilities) and DAD(death and alive) domain where Non-Diabetics had higher scores which means they had better quality of life compared to Diabetics. Study done by Kavi A et al in Belgavi , India among elderly diabetic patients attending urban primary health care facility showed health related quality of life among elderly diabetics was lower in social domain as compared to other domains. Kavi et al study also showed that gender had no difference in QOL among diabetics which is similar to present study. However higher quality of life was found among diabetic males compared with diabetic females in a study done by Bansode B and Nagarajan R.¹⁶ Educational status will always impart a significant influence on the QoL score, suggesting a moderate elevation of the education levels showed a significant increase in the mean QoL scores among elderly diabetics. However in the present study, there was only significant difference in present-past-future domain among rural elderly and showing educational status had very little to do with QOL. Study done by P.E.WaÈndell and J. Tovi among diabetic subjects reported poorer HRQoL with lower perceptions of their general health compared with the age matched controls showing elderly diabetic subjects had a poorer HRQoL than the general population.¹¹ In the study done by Prasanna Kumar et al in tertiary care hospital Mysuru showed Poor QoL with older age and deterioration in the QoL of older age group with various factors and type II Diabetes being a important reason which is similar to present study. ¹² Study done by R. Ghassemzadeh, *et al.* in Iran using WHO – QOL among geriatric diabetics also showed

significant differences were found in physical, psychological and social domains between two groups ($P<0.05$) when compared with home and nursing home where those who were nursed at nursing homes had higher scores and better quality of life stressing the importance of nursing among Diabetics especially in elderly.¹³ Study done by Roopa K.S. and Rama Devi.G in Karnataka showed statistically significant gain in all the five domains of QOL following intervention program among elderly diabetics showing the importance of health educational intervention having a significant role in improvement of QOL which remains widely neglected. More of health educational programs should be promoted at all health care levels and this special group of elderly must not be neglected.¹⁴

The present study showed that married individuals had higher scores in many domains which were statistically significant however study done by Filipe Prazeres and Daniela Figueiredo among Diabetics in elderly showed no significant differences between marital status and QoL.¹⁵ The diabetes patients in India are having low quality of physical, mental and social life. The awareness about diabetes prevention and management should be increased through disease management programs, trained peers and community health workers and community-based programs.¹⁶

Strengths and Limitations

The present study is a community based study and House to house survey was done using a standardized WHO questionnaire. The present study is also with many weaknesses. In the present study those elderly participants who were already diagnosed with Type II Diabetes were involved and no new attempt were made to diagnose newer cases and initial mental status evaluation among the participants would have added more strength as cognitive functions would be impaired after 60 years. Although various studies have been compared but the tool used in comparison are different.

Conclusion

Old age itself compromises QOL which is added with burden of Type II Diabetes among this age group. Health education regarding activity and environmental changes with increase in social relationship will help improving the QOL among the elderly population which is the pressing need among this age group today.

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Prevalence of Malnutrition in Under-Five Children of Mittapalem Village in Rayalaseema Region

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ABSTRACT

Background: Nutritional status of children is one of the major components of economic development of the country. Annually, about 1.83 million children die before completing their fifth birthday. Majority of such deaths can be prevented by effective screening and timely intervention as deaths are more due to malnutrition. Even-though there is decrease in prevalence of underweight and stunted children from NFHS-3 to NFHS-4, such children were reported more in rural India than urban. So, this study was intended to assess the nutritional status of under-five children in Mittapalem village. **Methods:** A community based cross sectional study was conducted from July to September, 2016 in Mittapalem village located about 3 km from Chandragiri Mandal of Chittoor district, Andhra Pradesh. Forty one under-five children were identified and recruited. Nutritional status was assessed by collecting anthropometric measurements of weight, height and Mid Upper Arm Circumference. **Results:** Prevalence of stunting was observed in 31% of boys and 24 % of girls, while wasting was observed in 6.3% of boys and 16% of girls. 6.3% of boys had chronic energy deficiency while girls had 12%. Boys and girls had undernourishment of 6.3% and 12%, respectively. **Conclusion:** Prevalence of chronic malnutrition is 5 times higher among boys and 1.5 times among girls than acute malnutrition in under-five children. It can be corrected by improving health and nutritional status of women and children by provision of access to community health services, production of nutritious staple crops and curtailing poverty by providing sustainable livelihood for women.

Key-words: Under-five children, malnutrition, community health services.

INTRODUCTION

Ensuring adequate nutrition is a key factor and determinant of health and development for any age, starting from childhood. While there have been several achievements in economic progress in the country, the fruit of development towards a better nutritional status of children is yet to unfold. Children are the country's largest investment as they are the future of the Nation. Nutritional status of children is one of the major components of economic development of any country. According to United Nations Children's Fund (UNICEF) malnutrition in its various forms, including under-nutrition has been coined as 'silent emergency' as it is associated with an impact on maternal and child health across the world.^{1,2} Around the world, including India, morbidities associated with micronutrient deficiencies and under-nutrition remain a major public health problem.³ As per World Health Organization (WHO), children with malnourishment have lower resistance to infections and die from common childhood ailments such as respiratory infections and diarrheal diseases. Those who survive are locked into a vicious cycle of recurring sickness, diminished learning ability, faltering growth and frequent illness saps their nutritional status.⁴

Annually, about 1.83 million children die before completing their fifth birthday and most of them are due

to preventable causes.⁵ As per global data, in 2012, about 99 million (15%) under five children were under-weight, 162 million (25%) were stunted, and 51 million (8%) were wasted, where 80% of these stunted children living in just 14 countries.⁶ In 2015, 5.9 million under 5 children died worldwide. About 45% of all child deaths were linked to under nutrition. Hence, evaluation of nutritional status of children is imperative, as it is an important index of national development.^{7,8}

According to 2011 censuses, there are 472 million children of 0–18 years, comprising 39% of the country's population and there is a huge burden of under nutrition among children.⁹ There is a decline in the prevalence of underweight and stunted under-five children from National Family Health Survey-3 (NFHS-3) (48.0% and 42.5%, respectively) to NFHS-4 (38.4% and 35.7%, respectively).¹⁰ However, as per NFHS-4 reports, underweight and stunting in children were higher in rural India than in the urban population. Therefore, the present study was conducted to assess the nutritional status of under-five children in Mittapalem village, Andhra Pradesh, India.

A community based cross sectional population study was conducted from July to September, 2016 in Mittapalem village located about 3 km from Chandragiri Mandal of Chittoor district, Andhra Pradesh, India. Ethical clearance was obtained from the Institutional ethics committee of Sri Venkateswara Medical College, Tirupati, Andhra Pradesh, India. Mittapalem village comprises of 102 households (HHs). Total population was 535 where 257 were males and 278 were females. Line listing survey was conducted and found to have 41 under-five children among total population. All the children were recruited for the study after taking oral and written consent from their parents. No child was found to have critical illness or congenital anomalies to exclude from the study.

Parents were interviewed using a pretested semi-structured interview questionnaire. Socioeconomic and demographic particulars such as community, religion, education, occupation, and income were collected from all the selected HHs using a precoded and pretested questionnaire. The remaining survey instruments consisted of information on birth order, breast-feeding and complementary feeding practices, immunization status and morbidity profile of the child. Nutritional status was assessed by collecting anthropometric measurements. Height/length (up to the nearest 1 mm) of the children was measured using an infantometer/anthropometer rod and weight (up to nearest 100 g) using the SECA (Deutschland, Medical Scales and Measuring system, Hammer Steindamm 9-25, Hamburg, 22089, Germany by implementing standard procedures).¹¹ Mid Upper Arm Circumference (MUAC) was measured using fibre reinforced measuring tape.

Statistical Analysis:

Descriptive analysis was carried out using SPSS version 17.0 (SPSS Inc., Chicago, IL, USA). BG Prasad's rural scale was used to determine HH socio-economic status (using 2015 base year). Z scores for weight-for-age, height-for-age, weight-for-height, Body Mass Index (BMI)-for-age and MUAC-for-age were calculated using WHO Anthro v3.2.2 software. Underweight, stunting, wasting, chronic energy deficiency (CED), undernourishment, overweight and obesity in proportions were calculated based on WHO-UNICEF growth standards nutrition estimates, 2006 (<median -2 SD and <median -3 SD).¹² The children with <median -2SD of "weight-for-age", "height-for-age" and "weight-for-height" indices were classified as underweight, stunting and wasting, respectively. Children with <median -3SD of the same parameters were classified as "severe underweight", "severe stunting" and "severe wasting", respectively.

RESULTS

The under-five population of Mittapalem village of Chandragiri mandal, Chittoor district during July and September, 2016 comprised 16 boys and 25 girls. Majority (42.5%) of children were in the age group of 12-

35 months. Most of the children belonged to the middle socio economic class and were from joint families. Table 1 depicts the prevalence of malnutrition in the studied children. Prevalence of stunting was observed to be 31.3% in boys and 24% in girls, while 31.3% of boys and 32% girls were underweight and wasting was observed in 6.3% of boys and 16% of girls. Chronic energy deficiency (CED) was seen in 6.3% of boys and in 12% of the girls. Undernourishment was seen in Boys 6.3% and 12% of boys and girls, respectively.

Table 1: Prevalence of malnutrition in under-five children

Nutritional Status	Boys (n = 16)	Girls (n = 25)
Stunting		
Severe($\leq -3SD$)	25	4
Moderate($\leq -2SD$ to $-3SD$)	6.25	20
Normal($> -2SD$ to $< 2SD$)	62.5	68
Over-height($\geq 2SD$ to $3SD$)	-	4
Giant($\geq 3SD$)	6.25	4
Underweight		
Severe($\leq -3SD$)	18.75	-
Moderate($\leq -2SD$ to $-3SD$)	12.5	32
Normal($> -2SD$ to $< 2SD$)	56.25	64
Overweight($\geq 2SD$ to $3SD$)		4
Obese($\geq 3SD$)	12.5	
Wasting		
Severe($\leq -3SD$)	-	4
Moderate($\leq -2SD$ to $-3SD$)	6.25	12
Normal($> -2SD$ to $< 2SD$)	81.25	84
Overweight($\geq 2SD$ to $3SD$)	6.25	-
Obese($\geq 3SD$)	6.25	-
Chronic Energy Deficiency		
Severe($\leq -3SD$)	-	4
Moderate($\leq -2SD$ to $-3SD$)	6.25	8
Normal($> -2SD$ to $< 2SD$)	81.25	88
Overweight($\geq 2SD$ to $3SD$)	6.25	-
Obese($\geq 3SD$)	6.3	-
Undernourishment(MUAC)		
Moderate($\leq -2SD$ to $-3SD$)	6.25	12
Normal($> -2SD$ to $< 2SD$)	93.75	88

Values are percentages.

Table 2 reveals the distribution of nutritional status of the studied children, with respect to mother's age at marriage. Both, severe wasting and severe chronic energy deficiency were observed in children, whose mothers married before 18 years of age.

Table 3 depicts the nutritional status of under-five children stratified by birth-order and interval between indexing child and previous live birth. Underweight, wasting, CED and undernourishment were more in children other than the 1st child. Further, underweight, stunting, wasting, CED and undernourishment were seen more in children who had ≤ 2 year interval between two births.

Table 2: Distribution of Nutritional status of under-five children with respect to their mother's age at marriage

Nutritional status	Mother's age at marriage	
	≤18 years (n=20)	> 18 years (n=21)
Underweight		
Severe(≤ -3SD)	-3.36±0.16 (2)	-3.75 (1)
Moderate(≤-2SD to -3SD)	-2.11±0.26 (6)	-2.36±0.18 (4)
Normal(> -2SD to < 2SD)	-1.20±0.67 (12)	-0.35±1.07 (13)
Overweight & Obese (≥ 2SD)	–	3.95±0.59 (3)
Stunting		
Severe(≤ -3SD)	-3.62±0.16 (2)	-3.59±1.36 (3)
Moderate(≤-2SD to -3SD)	-2.47±0.35 (4)	-2.30±0.52 (2)
Normal(> -2SD to < 2SD)	-0.77±0.63 (14)	-0.11±0.88 (13)
Wasting		
Severe(≤ -3SD)	-3.21 (1)	–
Moderate(≤-2SD to -3SD)	-2.75±0.49 (3)	-2.50 (1)
Normal(> -2SD to < 2SD)	-1.19±0.93 (16)	-0.69±0.91 (18)
Overweight & Obese (≥ 2SD)	–	4.16±1.9 (2)
Chronic Energy Deficiency		
Severe(≤ -3SD)	-3.26 (1)	–
Moderate(≤-2SD to -3SD)	-2.74±0.13 (2)	-2.58 (1)
Normal(> -2SD to < 2SD)	-1.09±0.96 (17)	-0.52±0.99 (18)
Overweight & Obese (≥ 2SD)	–	4.1±2.09 (2)
Undernourishment(MUAC)		
Moderate(≤-2SD to -3SD)	-2.16 (1)	-2.20±0.01 (3)
Normal(> -2SD to < 2SD)	-1.08±0.5 (19)	-0.60±1.19 (18)

Values are median±SD of Z-scores. Counts in parenthesis.

Table 4: Distribution of age groups with respect to morbidities

	Age group (in months)			Total (n=37)
	0 - 11 (n=11)	Dec-35 (n=15)	≥ 36 (n=11)	
Diarrhea	2 (18.2)	4 (26.7)	1 (9.1)	7 (18.9)
Acute Respiratory Tract Infections (ARI)	1 (9.1)	3 (20.0)	1 (9.1)	5 (13.5)
Fever & Diarrhea	-	-	2 (18.2)	2 (5.4)
Fever & ARI	-	-	1 (9.1)	1 (2.7)
Diarrhea & ARI	1 (9.1)	1 (6.7)	1 (9.1)	3 (8.1)
Fever, Diarrhea & ARI	2 (18.2)	-	-	2 (5.4)

Values are proportions. Proportion of subjects in parenthesis.

Table 4 shows the morbidities reported in under-five children. The number of children reported with diarrhea and ARI was higher in the 12-35 months age group

compared to the remaining two groups. Diarrhea and ARI were the most common morbidities reported in children aged under five.

DISCUSSION

The study reports the prevalence of underweight and stunting in under-five children of Mittapalem village to be 31.3% and 27.6%, which is below the national average of rural India (38.3% and 41.2%) as well as state average of rural populace of Andhra Pradesh (33.1% and 32.5%).^{10,13} Furthermore, the prevalence of nutritional status indicators of Mittapalem village (underweight-31.3%, stunting-27.6% and wasting-11%) was lower than Chittoor district (33.6%, 31.7% and 16.3%) respectively as well.¹⁴

In this study, 27.6% of under-five children were stunted in which more number of boys shows stunting (31.3%) than girls (24%). Prevalence of wasting and chronic energy deficiency was 12.2% and 12% in girls compared to 6.3% and 6% in boys. A study by Priyanka et al., in Kerala¹⁵, reported that the prevalence of underweight and stunting among the study subjects was found to be 28.3% and 14%, respectively and 49 (13.6%) children in the study group were both under-weight and stunted. Before the bifurcation of Andhra Pradesh, a rapid survey on children¹⁶ was conducted by UNICEF in 2013-14, which reported that 35.4% of under-five children in whole Andhra Pradesh were stunted and this was higher compared to Mittapalem (27.6%) as reported in this study. Compared to both the studies, the present study reports higher prevalence of underweight and stunting. However, the proportion of underweight is equal in both boys and girls; and the prevalence of wasting is more in girls and stunting was higher in boys, which differs from the study by Priyanka et al.¹⁵

The prevalence of stunting and wasting among girls at Mittapalem village is 24% and 16% compared to third round of National Nutrition Monitoring Bureau (NNMB) rural survey in 2012 of 31.2% and 13.8%, respectively.¹⁷ In this study 6.3% of boys are undernourished compared to NNMB survey of 10.7%. Prevalence of undernutrition, stunting and wasting was 36.6%, 44.7% and 15% was higher in the state of Andhra Pradesh compared to Mittapalem village.

Chronic malnutrition in the under-five children of Mittapalem village is 31% among boys and 24% among girls compared to acute malnutrition of 6.3% and 16.4%. Our study findings corroborate with the findings from NFHS 3 & 4. Government of India with the coordination of state government proposed and established Nutrition Rehabilitation Centers (NRC) to tackle Severe Acute Malnutrition (SAM).¹⁸ However, Severe Chronic Malnutrition is a major burden among communities due to poverty, poor housing, water and sanitation, unemployment and literacy.¹⁹ Therefore multi-sectoral approaches should be adopted to promote the adaptation of local healthy diets, improving feeding practices and enabling sustainable livelihood for the mothers.²⁰

Table 3: Distribution of nutritional status of under-five children with respect to Birth Order and Interval between indexing child and previous live birth

Nutritional status	Birth Order (n = 41)		Interval between indexing child and previous live birth (n = 41)		
	1st Child	Other than 1st child	1st Child	≤ 2 Years	> 2 Years
n	22	19	22	10	9
Underweight					
Severe(≤ -3SD)	–	-3.47±0.26 (3)	–	-3.75 (1)	-
Moderate(≤-2SD to -3SD)	-2.13±0.21 (5)	-2.39±0.24 (5)	-2.13±0.21 (5)	-2.30±0.27 (4)	3.36±0.16 (2)
Normal(> -2SD to < 2SD)	-1.14±0.92 (16)	-1.10±1.03 (9)	-1.14±0.92 (16)	-1.13±0.84 (3)	-2.39 (1)
Overweight & Obese (≥ 2SD)	3.95 (1)	3.45±0.72 (2)	3.95 (1)	3.45±0.72 (2)	-
Stunting					
Severe(≤ -3SD)	-3.51±0.08 (3)	-4.80±1.51 (2)	-3.51±0.08 (3)	-5.86 (1)	-3.73 (1)
Moderate(≤-2SD to -3SD)	-2.50±0.67 (2)	-2.47±0.27 (4)	-2.50±0.67 (2)	-2.71±0.21 (2)	-
Normal(> -2SD to < 2SD)	-0.79±0.88 (15)	-0.33±0.77 (12)	-0.79±0.88 (15)	-0.33±0.63 (6)	2.31±0.10 (2)
Wasting					
Severe(≤ -3SD)	–	-3.21 (1)	–	-3.21 (1)	-
Moderate(≤-2SD to -3SD)	-2.38±0.53 (2)	-2.72±0.30 (2)	-2.38±0.53 (2)	-2.50 (1)	-2.93 (1)
Normal(> -2SD to < 2SD)	-0.74±1.00 (19)	-1.17±0.3 (15)	-0.74±1.00 (19)	-0.48±0.47 (7)	-
Overweight & Obese (≥ 2SD)	2.82 (1)	5.50 (1)	2.82 (1)	5.50 (1)	1.40±1.08 (8)
Chronic Energy Deficiency					
Severe(≤ -3SD)	–	-3.26 (1)	–	-3.26 (1)	–
Moderate(≤-2SD to -3SD)	-2.83 (1)	-2.62±0.05 (2)	-2.83 (1)	-2.58 (1)	-2.65 (1)
Normal(> -2SD to < 2SD)	-0.64±1.08 (20)	-1.09±0.83 (15)	-0.64±1.08 (20)	-0.57±0.68 (7)	-
Overweight & Obese (≥ 2SD)	2.62 (1)	5.58 (1)	2.62 (1)	5.58 (1)	1.28±0.98 (8)
Undernourishment(MUAC)					
Moderate(≤-2SD to -3SD)	–	-2.19±0.02 (4)	–	-2.20±0.01 (3)	-2.16 (1)
Normal(> -2SD to < 2SD)	-0.98±0.83 (22)	-0.80±1.12 (15)	-0.98±0.83 (22)	-0.83±0.96 (7)	-

Values are median±SD of Z-scores. Counts in parenthesis.

Limitations:

Demographics and system level variables were not collected. Further, nutritive intake of children were not estimated, however, the findings highlight the anthropometric status of under-five children at Mittapalem village of Chittoor district of Andhra Pradesh.

Conclusion:

The study results reveal that under-five children had higher prevalence of chronic malnutrition than acute malnutrition and the prevalence is higher in girls than boys. Interventions at community level should be initiated to decrease the prevalence of chronic malnutrition by encouraging behavioral changes towards seeking of health care services, awareness among reproductive and

maternal women about healthy nutrition, ease of access to Integrated Child Development Services (ICDS) and Water, Sanitation and Hygiene (WASH) services and intake of nutritious diet of women and children and linking it with agricultural practices and sustainable livelihood for addressing poverty. Therefore, production and distribution of more nutritious staple crops are to be facilitated and its consumption has to be improved. Perspective, knowledge and skills among the health workers and Accredited Social Health Activists (ASHA) about the issues of health and nutrition has to be improved for provision of health education and improving quality of their services in the community.

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A Study of Clinico-Demographic Associates and Anthropometric Predictor of Hypertension in Urban Central India

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ABSTRACT

Objectives: The present study of hypertension and its association with demographic variables, physical activity, family history, co-morbidities namely diabetes mellitus and stroke, was conducted utilizing most appropriate methods of survey and analysis as per the scientific requirement for the study. **Methodology:** Community Based- Cross-Sectional survey in urban agglomeration of a central Indian city conducted for the period of 1 year. The adult population (20 years and above) who were residing under the premises of Municipal Corporation was considered as Target Population. Multistage Cluster sampling method supplemented by PPS (Probability Proportion to Size) sampling. The final sample calculated was size = 1350; 30 person per cluster in a total of 45 clusters. **Results:** The mean age of study participants was 43.8 (42.8-44.8 at 95% CI) years and mean age of Hypertensive participants was 53.9 (52.6-55.3) years at 95% CI. 11.04% (9.47-12.82 at 95% CI) of study participants were suffering from Diabetes Mellitus and proportion of person with stroke and hypertension as co-morbidity at 5.48% (3.97-7.51 at 95% CI). **Conclusions:** Multivariate analysis using Logistic Regression; Age, Family history, Physical Activity, Diabetes and stroke as they were the significant variable from the uni-variate analysis associate in the hypertension.

Key-words: Hypertension, Anthropometric predictor, co-morbidity, Urban, Demographic variables, India.

INTRODUCTION

I feel my head throbbing when I wake up in the morning; sometimes I feel my heart running race with my breath. The above words represent one of the way by which a patient may describes suffering from hypertension. However, there are evidences that elevated blood pressure produces structural changes causing damage to the arteries that supply blood to the brain, heart, kidneys and other organ without any warning symptoms! [1].

Though there are no unchallenged perspectives; clinical or epidemiological which defines Hypertension at a given level of blood pressure. Still there is some degree of accord among professional communities about continuous, incremental risk of cardiovascular disease, stroke, and renal disease across levels of both systolic and diastolic blood pressure [2].

Worldwide prevalence estimates for hypertension may be as much as 1 billion individuals. The World Health Organization reports that Systolic Blood Pressure (SBP) >115 mmHg is responsible for 62 percent of cerebrovascular disease and 49 percent of ischemic heart disease (IHD), with little variation by sex [3].

Prevalence in developing countries is almost found to be similar to developed societies ranging from 10 percent to as much as 20 percent among adults [4].

A number of studies have been conducted on prevalence of hypertension in India. These studies have been carried out in different geographic areas and in urban as well as rural area populations. Many of these studies have used the criterion for hypertension as systolic BP > 140 mm Hg and / or diastolic BP > 90 mmHg, shown a high prevalence of hypertension among urban adults ranging from 20 to 40% approximately [5].

Hypertension usually occurs in conjunction with other metabolically linked risk factors. The risks of cardiovascular disorders are proportional to the levels of BP for any age or either sex. The metabolically linked disorders are the key factor causing mortality which may be attributed to the hypertension.

Among the metabolic linked disorders, the growing prevalence of obesity is increasingly recognized as one of the most important risk factors for the development of hypertension. Obesity and in particular central obesity have been consistently associated with hypertension and increased cardiovascular risk. The risk of hypertension is 5 times higher in the obese as compared to non-obese person. Obesity attributes >85% to all hypertension cases [6, 7].

There is a scope to learn and apply about hypertension and its association with demographic variables, physical activity, family history, co morbidities namely diabetes mellitus and stroke. The present study with this rational was conducted

utilizing most appropriate methods of survey and analysis as per the scientific requirement for the study.

METHODS

Present study was a Community Based- Cross-Sectional survey in urban agglomeration of a central Indian city in which wards were labeled as delineated clusters. Study was undertaken from the month of November 2012 to the month of October 2013 for a period of 1 year. The adult population (20 years and above) who were residing under the premises of Municipal Corporation was considered as Target Population. Further the informed consent was obtained from sampled population. Also, Participants with known secondary hypertension, pregnancy, ascites and severely debilitated as of unable to be interviewed e.g.: profound dementia etc. were excluded from study.

Sampling Method: Multistage Cluster sampling method involving following stages was used. This sample strategy was supplemented by PPS (Probability Proportion to Size): [8]

Stage I: The 66 wards of Municipal Corporation were considered as primary sampling units (PSUs) out of which 45 clusters were selected randomly using the simple random sampling by random number tables. In Stage II In each of the selected clusters, households were randomly selected using a random strategy- First household was selected randomly as given by WHO EPI recommendation [9]- some central point in the community, the market in the case of this study, was chosen. A random direction is chosen from the chosen central point, the number of household are counted from that point to the edge of the area and one household is chosen at random from that as starting point of survey then every 5th house hold is chosen. In continuation of Stage III: All the Eligible persons of the households were selected till the desired sample size is reached.

PPS sampling: The relevance to include PPS in the study is embedded in its two stage methods:-

In First stage: Selected larger clusters have bigger probability of being sampled. In Second stage: Sampling exactly the same number of individuals per cluster -individuals in large clusters have smaller probability of being sampled than Overall Second stage compensates first stage, so that each individual in the population has the same probability of being sampled.

Steps in applying Probability Proportional to Size (PPS): A List of primary sampling units (all 66 wards of Municipal Corporation) and their population sizes was prepared, and cumulative sum of the population sizes was also calculated, the final sample calculated was size = 1350; 30 person per cluster in a total of 45 clusters.

Survey Performa and its elements:-

A semi-structured questionnaire was prepared while taking account of Clinico-demographic Variables namely age and sex, Family History of Hypertension, Physical Activity, Comorbidities namely Diabetes Mellitus and CVA was prepared. Also Anthropometric Indicators viz Body Mass Index (BMI), Waist Circumference (WC) and Hip circumference, were also measured and recorded. After the informed consent from each individual, using the preformed semi-structured perform, A pilot study was carried out and necessary corrections had been made.

Ethical Approval: The study protocol was approved by the Institutional Ethical Committee (IEC) of Gandhi Medical College and associate Hospital, Bhopal, MP, India. Informed consent was taken from each individual study subject and ensuring that this information will use only in research purposes.

Methods of Statistical Analysis:-

For Uni-variate analysis, Chi (χ^2) square test with Yates correction was used, P value with <0.05 was considered as significant. For Multivariate analysis, Logistic Regression

Model constructed using significant variables from uni-variate analysis. Wald Chi square, standard error of mean and odd ratios was determined using this model. A value of <0.05 for P was considered significant.

Receiver operating Characteristic (ROC) curve:

Sensitivity, specificity, positive/negative predictive value and likelihood ratio for each measurement tools (BMI/WC/WHR) were separately calculated for male and female. ROC curves for each tool were drawn to check the discriminating capacity among diseased and non diseased assuming measures as continuous variable. This study examines the performance of tools over a range of decision levels through D'long-D'long non-parametric.

RESULTS

Table-1. Measures of performance of hypertension associated factors with associated morbidity factors under study.

Characters/ Variables	Research subject No. (%) N=1350	No.(%) with associate Morbidity in hypertension N=657	P value
Age group in years			<0.0001
20-29	407(30.15)	51(7.63)	
30-39	310(22.96)	126(19.18)	
40-49	153(11.33)	82(12.48)	
50 and above	480(35.56)	398(60.58)	
Gender			0.6891
Male	688(50.96)	339(51.6)	
Female	662(49.04)	318(48.4)	
Family History			0.0077
Present	180(25.97)	215(32.72)	
Absent	513(74.03)	442(67.28)	
Level of Physical activity			0.0001
Sedentary	241(34.8)	271(41.2%)	
Moderate	252(36.4)	312(47.5)	
Heavy	200(28.9)	74(11.3)	
Diabetes Mellitus			<0.0001
Present	05(0.72)	144(21.9)	
Absent	688(99.28)	513(78.1)	
Stroke			<0.0001
Present	02(0.29)	36(5.48)	
Absent	691(99.71)	621(94.52)	

Uni-variate Analysis: The findings are summarized in the Table-3. The results thus obtained provides basis for eligibility to multivariate analysis. The various observation pertaining to the associated variables in this analysis are given below:-

The mean age of study participants was 43.8 (42.8-44.8 at 95% CI) years. The maximum numbers of participants contributing to study belong to the age group 50 years and above (35.56%) followed by 20-29 year age group (30.15%). On further segregation, the occurrence of hypertension was mostly in 50 year and above age group (60.58%) followed by 30-39 year age group (19.18%). The mean age of Hypertensive participants was 53.9 (52.6-55.3) years at 95% CI. (Table-1)

Out of total, 50.96 % (48.3-53.6 at 95% CI) of study participants were male against 49.04 % (46.4-51.7 at 95% CI) Female. On further segregation, the occurrence of hypertensive in male was more i.e. 51.6 % (47.8-55.4 at 95%CI) as compared to female i.e. 48.4 % (44.6-52.2 at 95% CI). 26% (26.89-31.74) of total participants were having a family history of hypertension. Out of total 657 hypertensive 32.72 % (29.24-36.41) at 95% CI, have family history of hypertension. (Table-1)

Out of the total 657 hypertensive patients only 11.3% (9.48-13.42) at 95% CI, were having heavy level of physical activity against 28.9% (26.17-31.79) at 95% CI, among the non-

hypertensive population. The percentage of person with sedentary level of physical activity among hypertensive participants was 41.2% (38.19-44.28) at 95% CI, compared to 34.8 % (31.91-37.81) at 95% CI, among non-hypertensive participants. The less percentage of people with heavy level of physical activity among hypertensive compared to non-hypertensive is most noticeable finding. (Table-1)

Out of total, 11.04% (9.47-12.82 at 95% CI) of study participants were suffering from Diabetes Mellitus. 21.9% (18.92-25.24 at 95%CI), among hypertensive individual were also having Diabetes mellitus as co-morbidity. The percentage of person without hypertension having diabetes was only 0.72 (0.262-1.73) at 95%CI.

A total of 2.8% (2.05-3.85) at 95%CI, of stroke affected person were among the studied population. The most noticeable finding was the proportion of person with stroke and hypertension as co-morbidity at 5.48% (3.97-7.51 at 95% CI). (Table-1)

Multivariate Analysis: Following Variables were used for multivariate analysis using Logistic Regression: Age, Family history, Physical Activity, Diabetes and stroke as they were the significant variable from the uni-variate analysis. Sex was not used for multivariate as it didn't turn out to be statistically significant in uni-variate analysis (P value =0.6891). The Overall Performance of Multivariate Regression model is shown in Table 2a with explanatory notes following it.

Table.2a: Overall Performance of the Regression Model in term of gain in predicting hypertension.

Predictor Variables	I (predictor coefficient)	S.E	Wald Chi-square	P value	ODD Ratios
Age	-0.077	0.005	227.330(df=1)	0	.926(.908-.941)
Fam_Hist	0.991	0.158	39.600(df=1)	0	2.694(2.59-2.79)
Phy_Activit			40.507(df=2)	0	
Phy_activit_1 [@]	0.562	0.229	6.038(df=1)	0.014	1.754(1.67-1.84)
Phy_activit_2 [#]	-0.538	0.188	8.169(df=1)	0.004	0.584(0.538-0.633)
Diab_mellit	2.499	0.427	27.998(df=1)	0	12.164(11.495-12.863)
Stroke	2.143	0.757	8.016(df=1)	0.005	8.525(8.346-8.710)
Constant	-1.746	0.937	3.475(df=1)	0.062	0.174(0.149-0.202)

Table.2b: Predictors with their relative contribution in models with statistical certainty & odd ratios

Predictor Variables	I (predictor coefficient)	S.E	Wald Chi-square	P value	ODD Ratios
Age	-0.077	0.005	227.330(df=1)	0	.926(.908-.941)
Fam_Hist	0.991	0.158	39.600(df=1)	0	2.694(2.59-2.79)
Phy_Activit			40.507(df=2)	0	
Phy_activit_1 [@]	0.562	0.229	6.038(df=1)	0.014	1.754(1.67-1.84)
Phy_activit_2 [#]	-0.538	0.188	8.169(df=1)	0.004	0.584(0.538-0.633)
Diab_mellit	2.499	0.427	27.998(df=1)	0	12.164(11.495-12.863)
Stroke	2.143	0.757	8.016(df=1)	0.005	8.525(8.346-8.710)
Constant	-1.746	0.937	3.475(df=1)	0.062	0.174(0.149-0.202)

@ Phy_activit_1 represents difference between Level 1 and 3 of physical activity (i.e. sedentary and heavy) #Phy_activit_2 represents difference between Level 2 and 3 of physical activity (i.e. moderate and heavy)

The Step 0, or the null model, includes no predictors and just the intercept, in the model summary. The "Observed in the study population" indicates the number of present and absent that are observed in the dependent variable. i.e. hypertension. This model predicts all the cases are 0 on dependent variable and the overall Percentage gives the percent of cases for which the dependent variables was correctly predicted given the model.

In Step1 model, The "Observed in the study population" indicates the number of present and absent that are observed in the dependent variable. i.e. Hypertension. This model predicts the values of the dependent variable i.e. Hypertension based on the full logistic regression model. 484 cases are observed to be hypertensive and are correctly predicted to be hypertensive; 544 cases are observed to be normotensive and are correctly predicted to be normotensive and 173 cases are observed to be hypertensive but are predicted

to be normotensive; 149 cases are observed to be normotensive but are predicted to be hypertensive).

The overall percent of cases that are correctly predicted by the model percentage has increased from 51.3 for the null model to 76.1 for the full model.

The Analytical finding and results of Multivariate Regression Model are summarizing in Table 2b with formulation of Predictor Equation based on findings of analysis.

The Predictor Coefficients (I) are the values for the logistic regression equation for predicting the dependent variable (hypertension in this study) from the independent variable (all significant variables listed above). They are in log-odds units. S.E, the standard errors associated with the coefficients. The standard error is used for testing whether the parameter is significantly different from 0 and to form a confidence interval for the parameter. Constant-This is the expected value of the log-odds of proportion of hypertension when all of the predictor variables equal zero.

Regression Model or Predictor Equation for Hypertension is:-

$$\text{Log}(p/1-p) = \text{Constant} + I_{\text{age}} + I_{\text{Fam_Hist}} + I_{\text{Phy_activit_1}} + I_{\text{Phy_activit_2}} + I_{\text{Diabet_mellit}} + I_{\text{Stroke}}$$

Where, p is the probability of having hypertension. Expressed in terms of the variables used in this Logistic Regression model:-

$$\text{Log}(p/1-p) = -1.746 + (-0.077) + 0.991 + 0.562 + (-0.538) + 2.499 + 2.143$$

These estimates tell the amount of increase (or decrease, if the sign of the coefficient is negative) in the predicted log odds of hypertension= 1 that would be predicted by a 1 unit increase (or decrease) in the predictor, holding all other predictors constant.

C. ROC Curves: There were 688 males and 682 females in the study out of which 339 males and 328 females were hypertensive (sample prevalence=48.7%). The demographic and anthropometric characteristics of studied normotensive and hypertensive population are shown in the table.3a.

Table .3a: Demographic and Anthropometric Characteristics of Population under study

Sex	Disease Status	Age(Years)	Mean BMI(kg/m2)	Mean WC (In c.m.)	Mean WHR
Male	Hypertensive(339)	50.18(±17.85)	23.04(±4.41)	89.12(±8.64)	0.952(±0.065)
-688	Normotensive(349)	39.40(±16.81)	20.60(±1.92)	87.19(±6.89)	0.953(±0.056)
Female	Hypertensive(318)	57.04(±16.84)	30.17(±7.06)	100.14(±13.90)	0.916(±0.053)
-682	Normotensive(344)	29.03(±7.55)	24.96(±3.80)	86.27(±8.02)	0.884(±0.052)

Table.3b: Validity and Predictive Accuracy of Body Mass Index, Waist Circumference and Waist Hip Ratio to predict Hypertension

Sex	Obesity Measure ment Tool	Sensitivity	Specificity	Predictive Value		Likelihood Ratio	
				Positive	Negative	Positive	Negative
Male	Body Mass Index	0.954(0.927-0.974)	0.357(0.306-0.410)	0.883(0.817-0.932)	0.604(0.562-0.645)	7.79(4.7-12.8)	0.67(0.6-0.7)
	Waist Circumference	0.472 (0.418-0.527)	0.553 (0.499-0.606)	0.506 (0.450-0.563)	0.519 (0.467-0.571)	1.06(0.9-1.2)	0.95(0.8-1.1)
	Waist-Hip Ratio	0.829 (0.785-0.867)	0.198 (0.157-0.243)	0.501 (0.459-0.543)	0.543 (0.452-0.632)	1.03(1.0-1.1)	0.87(0.6-1.2)
	Body Mass Index	0.695 (0.641-0.745)	0.611 (0.557-0.662)	0.623(0.570-0.673)	0.684(0.629-0.736)	1.78(1.5-2.1)	0.5(0.4-0.6)
Female	Waist Circumference	1 (0.988-1.000)	0.258 (0.213-0.308)	0.555 (0.515-0.596)	1 (0.959-1.000)	1.35(1.3-1.4)	0
	Waist-Hip Ratio	0.893 (0.854-0.925)	0.256 (0.211-0.305)	0.526 (0.483-0.569)	0.721 (0.633-0.799)	1.2(1.1-1.3)	0.42(0.3-0.6)

WC-Waist Circumference, WHR- Waist –Hip Ratio

The table.3b shows performance of the studied obesity measures to envisage hypertension. BMI was detected most sensitive obesity measures tool allied with hypertension in males, but less specific than Waist Circumference. (Fig.1a) Waist circumference was detected most sensitive obesity measures tool allied with hypertension in females but less specific than BMI.(Fig.1b) Positive predictive value (PPV) was highest for BMI in both sexes and Negative Predictive Value (NPV) was highest for WC in Female, though in male it was BMI which has the highest NPV.

Fig.1a: **Receiver-operating characteristic (ROC)** plots for Obesity Measures in Males Showing the trade-off trend between sensitivity and specificity for alternative tests (WC/BMI/WHR) for male sex.

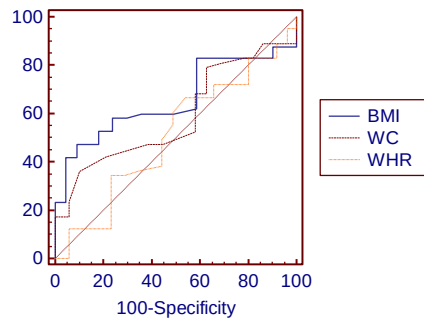
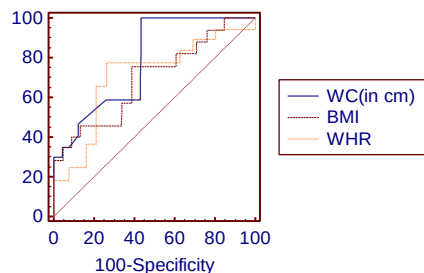


Fig.1b: **Receiver-operating characteristic (ROC)** plots for Obesity Measures in Females.: Showing the trade-off trend between sensitivity and specificity for alternative tests (WC/BMI/WHR) for female sex.



The results of the paired comparisons for Area under Curve for WC/BMI/WHR are as shown in Table6. BMI occupied the maximum Area under Curve (AUC) in male sex while, Waist circumference occupied the maximum Area under Curve (AUC) in female sex. The paired comparison difference was significantly higher for Waist circumference with other two studied variable in female and all pair comparison difference were significant in male. The paired comparison difference was not significant for WHR and BMI in female.

DISCUSSION:-

The current study with its community based survey approach followed by rigorous analysis sought to answer various impending questions woven around Hypertension and its clinico-metabolic milieu. Further it derives the benefits from studies and evidences already generated indicating obesity as greatest associate to such an extent that the anthropometric tools for measuring it leading to prediction of the hypertension itself.

The findings indicated that out of total number of hypertensive patients 82.9% were above 50 years indicating a clear predilection of increasing age as a major risk factor for hypertension. Generally the risk increases in stages as the person gets older. The reasons include hardening, less activity & elasticity of arteries which interferes with the circulation & hence alters the peripheral resistance. The advancing age has

also found to be associated with decreasing kidney functions, more sensitivity of body towards salt & hormonal changes such as menopause in females [10].

Table 4: Paired Comparisons of Area under Curve (AUC) for Body Mass Index, Waist Circumference and Waist-Hip Ratio

Sex	Obesity Measurement Tool	Area Under Curve(AUC)	D'long-D'long Paired Comparison		
			Contrast	Difference in curve area	p-value
Male	Body Mass Index	0.657±0.0218(0.621-0.693)	WC Vs BMI	0.0705±0.0151(0.0408-0.100)	<0.0001
	Waist Circumference	0.587±0.0222(0.549-0.624)	WC vs WHR	0.0794±0.0184(0.0433-0.116)	<0.0001
	Waist-Hip Ratio	0.507±0.0223(0.469-0.545)	WHR vs BMI	0.150±0.0221(0.107-0.193)	<0.0001
Female	Body Mass Index	0.696±0.0203(0.659-0.731)	WC Vs BMI	0.0880±0.0178(0.0530-0.123)	<0.0001
	Waist Circumference	0.784±0.0175(0.750-0.814)	WC vs WHR	0.0752±0.0210(0.0340-0.116)	0.0003
	Waist-Hip Ratio	0.708±0.0209(0.672-0.743)	WHR vs BMI	0.0128±0.0298(-0.0454- 0.071)	0.6669

This study also revealed that 49.2% (46.11-52.30) of males have hypertension while the females with hypertension were 48.04(44.92-51.10). The association of hypertension with sex was found to be insignificant.

Men are at greater risk of developing Hypertension than the age-matched, premenopausal women. After menopause, however, BP increases in women to levels even higher than in men suggesting that ovarian hormones may modulate blood pressure [11, 12] this variation may account for the resultant insignificance.

As for association with family history; the study finds that out of total hypertensive, 32.72 % (29.24-36.41) have family history of hypertension & thus the association between hypertension and Family History is considered to be very statistically significant. Family history of hypertension would be related to the increased renal proximal sodium re-absorption, impaired arterial compliance & a positive relationship of norepinephrine, insulin resistance and lipids to family history of hypertension, these mechanisms could explain the higher prevalence of hypertension in the off springs of hypertensive parents [13, 14,15].

Hypertension and physical activity were found to be inversely related in the finding of analysis.

Out of total; 11.3 % (9.48-13.42) were having heavy level of physical activity against 28.9% (26.17-31.79), among the non-hypertensive population. Conversely, the percentage of person with sedentary level of physical activity among hypertensive participants was 41.2% (38.19-44.28) compared to 34.8 % (31.91-37.81), among non-hypertensive participants. The less percentage of people with heavy level of physical activity among hypertensive compared to non-hypertensive is most noticeable finding.

A regular exercising individual i.e. a physically active individual is at a lower risk of developing hypertension as compared to an individual with a sedentary life style. Daily exercise is a remedy or preventive measure for cardiovascular problems. By increasing blood flow and promoting cardiovascular efficiency, exercise provides benefits to the entire circulatory system.

Regular exercise trains the heart to respond quickly and efficiently to external physical stresses. Additionally, regular physical activity can modestly lower blood pressure by reducing total peripheral resistance & it would also help to curb the growing menace of obesity and co morbidities of metabolic syndrome including Hypertension [16, 17].

The findings showed that total 11.04% (9.47-12.82) of total study participants were suffering from Diabetes Mellitus. 21.9% (18.92-25.24) among hypertensive individual were also having Diabetes mellitus as co-morbidity. The percentage of person without hypertension having diabetes was only 0.72 (0.262-1.73) this represents a strong association of both the conditions as a twin epidemic.

It has been found that Diabetes and Hypertension share common pathways such as Sympathetic Nervous System, Renin Angiotensinogen Aldosterone System, oxidative stress, adipokines, insulin resistance and Peroxisome Proliferator Activated Receptors. These pathways interact and influence each other and may even cause a vicious cycle. Hypertension and diabetes are both end results of the metabolic syndrome. They may, therefore, develop one after the other in the same individual. Another possible mechanism may be related with diabetic nephropathy as it increases the total amount of fluid in the body, which tends to raise blood pressure. Diabetes can also decrease the ability of the blood vessels to stretch, increasing average blood pressure [18, 19].

The related findings showed a total of 2.8% (2.05-3.85), of stroke affected person were among the studied population. The most noticeable finding was the proportion of persons with stroke and hypertension as co-morbidity that was found to be 5.48% (3.97-7.51) the pathological effects of Hypertension on blood vessels increases risk for both ischemic as well as hemorrhagic stroke. A high intra-luminal pressure will lead to extensive alteration in endothelium and smooth muscle function in intra-cerebral arteries. The increased stress on the endothelium can increase permeability over the blood-brain barrier and local or multifocal brain edema. Endothelial damage and altered blood cell-endothelium interaction can lead to local thrombi formation and ischaemic lesions. Fibrinoid necrosis can cause lacunar infarcts through focal stenosis and occlusions. Degenerative changes in smooth muscle cells and endothelium predisposes for intracerebral haemorrhages. Furthermore, hypertension accelerates the arteriosclerotic process, thus increasing the likelihood for cerebral lesions related to stenosis and embolism originating from large extracranial vessels, the aortic arch and from the heart [20].

In Multivariate Analysis of Significant Variables using Logistic Regression it was concluded in a nutshell that the Diabetes mellitus is most significant predictor of hypertension followed by stroke (CVD) and Family history respectively.

Waist circumference was found to be better predictor of hypertension in female owing to more abdominal obesity with less stature, while BMI was found to be better predictor in studied male participants owing to less visceral fat and larger stature compared to female counter part.

BMI values are age-independent and the same for both sexes. However, BMI may not correspond to the same degree of fatness in different populations due, in part, to different body proportions. The health risks associated with increasing BMI are continuous and the interpretation of BMI grading in relation to risk may differ for different populations.

The current study aimed at detecting the association of hypertension with certain variables also finds as byproduct that the prevalence of hypertension in the urban agglomeration of central India is alarmingly high (48.7%). A comprehensive strategy to prevent the complications associated with Hypertension making provision for both early identification & effective management of individuals with hypertension as well as prevention of hypertension by measures aimed at reducing the BP levels in the population as a whole is required. Research into the genetic basis of hypertension should be encouraged as the information gained from specific genes and positional cloning may identify new genetic polymorphisms that possibly influence blood levels, cardiovascular risk and response to therapy. The findings of this research have the potential to improve the quality and methods of decision-making in the

prevention of hypertension and be harnessed to assist the health professional to control hypertension and associated risk factors in patients and population. Lifestyle measures to reduce obesity, increasing physical activity should be instituted in all patients ranging from normotensive to moderate and severe hypertensive.

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A Study of Quality of Life on Nurses Working at Medical College of a City in Central India.

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ABSTRACT

Introduction: Quality of life (QOL) has become an important issue in modern world. The present study is a cross sectional study conducted at hospitals associated with Ruxmaniben Deepchand Gardi Medical college of Ujjain city of Madhya Pradesh State of Central India. **Objectives:** To determine the Quality of Life of nurses as measured by World Health Organization (WHO) Quality of Life Questionnaire (BREF) and to find the association between Quality of life and Demographic variables such as age, gender, level professional qualification and marital status. **Material and methods:** It is a cross sectional study with a total sample size of 322 nurses from all the included hospitals. WHO BREF tool was used for assessment of Qol, satisfaction with health and demographic variables: age, gender, marital status and education level. A total 26 questions pertaining to quality of life: rating overall quality of life, overall satisfaction with health, and rest questions were grouped into four domains which affect overall QOL: Physical, Psychological, environmental and social relationship domains. **Result:** Most of the participants (50.9%) rated their quality of life as good and most of them (53.7%) were satisfied with their current health status. The physical health domain scores are significantly related with the sex of respondents, male performing better than female. The overall QOL and social relationship domain shows statistically significant relationship with marital status. **Conclusion:** The current study supports the conviction of complexity in factors affecting Qol and satisfaction with health. The multidimensional aspect of Qol assessed in this study using WHO BREF revealed that age and gender are not significant factors in contrast to the education level and marital status of participants. However these findings are not same for the domains assessed; further implying intricacy and need of further studies.

Key-words: Quality of life, Nurse, Health Satisfaction, WHO BREF

INTRODUCTION

Quality of life (QOL) has become an important issue in modern world and studies have been published on this topic focusing a diverse group of participants enrolled on basis of their profession, residential status, and health status.¹⁻⁴ Studies have been conducting in many countries focusing the nurses' QOL, who are large group of health care provider, working in diverse setting from intensive care unit to the level of grass root in close proximity of the dwelling of populace in community.⁵⁻⁷ At the same time, the studies conducted on this important health provider's faction when considering the Indian scenario are very less in number and mainly done in south India.^{8,9} The present study is conducted with objectives to determine the Quality of Life of nurses as measured by World Health Organization (WHO) Quality of Life Questionnaire (BREF) and to find the association between Quality of life and Demographic variables such as age, gender, level professional qualification and marital status.

METHODOLOGY

The present study is a cross sectional study conducted at hospitals associated with Ruxmaniben Deepchand Gardi Medical college of Ujjain city of Madhya Pradesh State of

Central India. The total number of beds of the associated hospitals is more than 1000 bed when considered together. WHO BREF tool, a 26 item questionnaire, for quality of life assessment was used for collection of data.¹⁰ Among the nurses in the staff those who were working in respective hospital for atleast six month, who granted informed consent after the purpose and procedure of study was explained, were recruited for the study. Those participants who were having severe chronic diseases and were not registered with nursing council were excluded from study. Total sample size was 322 nurses from all the included hospitals in the study. Institutional ethical committee approval was obtained beforehand. The variables in the WHO BREF tool which were used for conducting interview were mainly in two sections. The first section is composed of socio-demographic variables: age, gender, marital status and education level. The second section is composed of a total 26 questions pertaining to quality of life: rating overall quality of life, overall satisfaction with health, and rest questions were grouped into four domains which affect overall QOL: Physical, Psychological, environmental and social relationship domains.

The 4 domains are factors based on the 24 questions which make up the WHOQOL-BREF. As such they are treated as continuous outcomes with each domain score converted to scores ranging from 0 to 100. Additionally, responses to the first two questions were also converted to score ranging between 0 to 100 for making it possible to compare and relate the result quantitatively by means and standard deviation. Data was entered and analyzed in SPSS ver 16.0. Unpaired sample t test and chi square test was utilized for finding statistical significant relationship between socio-demographic variables and scores obtained for overall QOL, satisfaction with health and four domains.

RESULTS

Most of the participants (50.9%) rated their quality of life as good and most of them (53.7%) were satisfied with their current health status. The participants' socio-demographic characteristics are shown in **Table.1**.

Table.1: Socio-Demographic characteristics of study population

Age(yrs)	N=322
Max	54
Min	20
Mean	30.38
SD	5.11
Gender	N (%)
Male	223(69.3)
Female	99(30.7)
Total	322(100)
Education	N(%)
Graduate	270(83.9)
Postgraduate	52(16.1)
Total	322(100)
Marital Status	N (%)
Married	183(56.8)
Unmarried	130(40.4)
Live in	6(1.9)
Divorcee	3(0.9)
Total	322(100)

Table.2 :Results obtained as a result of quantitative descriptive analysis of Overall Qol, satisfaction and four domains

Variable	Mean	SD	Min	Max
Over all QOL	77.72	18.12	25	100
Satisfaction with Health	73.76	18.12	25	100
Physical Health	69.66	12.35	38	88
Psychological Health	59.69	15.83	31	94
Social Relationships	74.67	20.38	6	100
Environment	57.9	16.92	18	94

The overall results obtained as per the four domain and questions pertaining to overall quality of life and satisfaction with health are shown in **Table.2**. The overall

internal consistency of the test was good with cronbach's alpha value of 0.821. Correlation matrix (**Table.3**) shows that all relationship between various domains, Qol and satisfaction with health was significant and positively correlated.

The results of the analysis when participants were grouped according to their socio-demographic study variables are shown in **Table.4**. In this study, statistically significant ($P=0.000$) but weakly positive correlation ($\rho=0.218$) was observed between age and satisfaction with health implying an increase in satisfaction with increased age. Additionally, statistically significant ($P=0.02$) weak negative correlation (-0.169) was found between age and psychological health of the participants implying that younger the age better is psychological health. All of the rest variables were not have any statistically significant correlation with the age of the participants.

The physical health domain score are significantly related with the sex of respondents, male performing better than female on test instrument ($P=0.027$). In contrast to this the environment domain score shows female being significantly outperforming males ($P=0.000$).

As far as education level is concerned, it has significant effect on psychological domain ($P=0.026$), higher the education better is the health. All other domains, overall QOL and satisfaction with health scores were not found to be different education level wise.

The overall QOL and social relationship domain shows statistically significant ($P=0.000$ & $P=0.002$ respectively) relationship with marital status. The overall QOL score is in favour of participants being not married in contrast with the social relationship domain showing results in favour of married participants.

DISCUSSION

The current study has focused mainly on the quality of life assessment of nurses in large hospitals of central India; where no such previous work has been done on such an important health aspect of these health care providers. Although more than half of the participants rated their overall quality of life being near good, it emerges from study that the quality of life is a multi-dimensional and multi-component aspect of work and personal life of nurses; with each dimension and component having its separate importance in its own.

The results of current study imply that age has little relationship with overall Qol, physical health, social relationship and work environment domains but significant relationship with satisfaction and psychological health. This is in contrast to a study conducted by **Fedar et al (2015)** using WHO-BREF on participants living around wind turbine, which found that age is significantly ($P=0.023$) related with over all Qol as well as all of the domains.⁴

In another study of measuring of quality of life of health care staff in Iran- using WHO-BREF (**Gholami et al 2012**) it was found that overall quality of life, social relationship domain and psychological health are

Table.3 Correlation Matrix showing inter-relationship between various domains, overall Qol and satisfaction with health

		Physical Health	Psychological Health	Social Relationships	Environment	Over all QOL	Satisfaction with Health
Physical Health	Pearson Correlation	1	.653**	.561**	.462**	.573**	.480**
	P value		0	0	0	0	0
Psychological Health	Pearson Correlation	.653**	1	.654**	.423**	.455**	.414**
	P value	0	-	0	0	0	0
	N	322	322	322	322	322	322
Social Relationships	Pearson Correlation	.561**	.654**	1	.387**	.354**	.500**
	P value	0	0	-	0	0	0
Environment	Pearson Correlation	.462**	.423**	.387**	1	.437**	.394**
	P value	0	0	0		0	0
Over all QOL	Pearson Correlation	.573**	.455**	.354**	.437**	1	.436**
	P value	0	0	0	0		0
Satisfaction with Health	Pearson Correlation	.480**	.414**	.500**	.394**	.436**	1
	P value	0	0	0	0	0	-
	Total Participants	322	322	322	322	322	322

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

Table 4. Relationship between socio-demographic factors of study population and domains, overall QOL & satisfaction with health.

Variable	Age		Sex		Education			Marital status			
Pearson's correlation	P	Male $\bar{x}$ (σ)	Female $\bar{x}$ (σ)	P	Graduate $\bar{x}$ (σ)	Post-Graduate $\bar{x}$ (σ)	P	Married $\bar{x}$ (σ)	Not Married* $\bar{x}$ (σ)	P	
Over all QOL	-0.029	0.606	77.69 (18.64)	77.78 (17.09)	0.97	76.85 (17.15)	82.21 (22.33)	0.051	74.18 (18.88)	82.37 (16.05)	0
Satisfaction with Health	0.218	0	73.65 (17.55)	73.99 (19.54)	0.88	74.44 (18.03)	70.19 (18.55)	0.112	74.04 (15.14)	73.38 (21.54)	0.75
Physical Health	-0.029	0.607	70.68 (13.08)	67.37 (10.22)	0.027	69.13 (11.58)	72.44 (15.57)	0.076	69.39 (12.81)	70.02 (11.74)	0.65
Psychological Health	-0.169	0.02	60.19 (16.72)	58.58 (13.63)	0.4	58.83 (15.31)	64.17 (17.82)	0.026	60.62 (16.14)	58.47 (15.4)	0.23
Social Relationships	0.044	0.435	75.9 (21.72)	71.9 (16.76)	0.104	73.87 (21.1)	78.81 (15.64)	0.11	77.7 (18.32)	70.68 (22.26)	0.002
Environment	0.019	0.737	54.75 (17.66)	64.99 (12.57)	0	58.12 (17.48)	56.75 (13.71)	0.593	57.73 (15.2)	58.13 (18.99)	0.83

significantly related with the age; however the physical health and environment health were not found to be related with age.¹¹

Many other similar studies conducted on quality of life of workers of diverse environment using some sort of psychometric scale found age to be a significantly correlated with the quality of life score.^{12, 13} (**dargahi, 2012; Albaqawi, 2018**). Conversely, **Moradi et al (2014)** in his study on Quality of Working Life of Nurses and its Related Factors found no relationship between age and quality of life.¹⁴

The findings of present study neither support any of sex having an overall quality of life better than other nor more satisfaction with health. Furthermore, no significant correlations were observed between psychosocial and social relationship domain. The relationship that was observed between environment health and physical domain were quiet contrasting. These findings suggest that the contribution of domains for rating quality of life matters differently for genders.

In a survey of nurses conducted for studying their quality of work life and related factor among 157 Intensive care unit nurses of hospital in kashan, Iran it was found that sex has no relationship with the quality of life ($P=0.371$).¹⁵ This is in contrast to finding of a cross sectional study of 100 nurses of a tertiary care hospital at yawatmal, Maharashtra, India, which showed a significant ($P=0.0332$) better quality of life for male compared to females (mean score of male nurse =164.2 versus 157.5 mean score of female).¹⁶

As far as education level is concerned, it has significant effect on psychological domain ($P=0.026$), higher the education better is the health. Owing to the fact that, the current study has participants having higher education only i.e. graduation (83.9%) and post graduation (16.1%), the effect on psychosocial domain suggest that better education may provide better understanding and confidence for performing task and thus counteracting psychosocial stressor in better way.

Though not many studies have been conducted for finding a relationship between education and quality of life and its domain, A Study of Quality of Working Life of Nurses

and its Related Factors by Moradi, Farzaneh & Azizi-Fini (2014) did found a significant relationship between education level and overall quality of work life ($P<0.05$).¹⁴

This study found that unmarried persons have significantly better overall quality of life as well as social relations domain score compared to married counterparts. In a study of evaluation of the health-related quality of life of Emirati people with diabetes using WHO-BREF found marital status to be significantly affecting the quality of life ($P=0.02$).¹⁵ The impression of better quality of life of unmarried person had been supported in a study conducted by Fedar et al (2015) among participants living around wind turbine.⁴

Distinguishingly, in another study done on 100 females nurses in a hospital in Chile, quality of life and associated factors were studied using WHO-BREF. This study found that among four domains only physical domain was not related with having a stable partner rest all domain showed a significant relationship, better QoL with those having a partner.¹⁷

Conclusion

To conclude, the current study supports the conviction of complexity in factors affecting QoL and satisfaction with health. The multidimensional aspect of QoL assessed in this study using WHO BREF revealed that age and gender are not significant factors in contrast to the education level and marital status of participants. However these findings are not same for all four of the domain assessed; further implying intricacy and need of further studies.

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Risk factors associated with MSDs among working women – Need of the hour!

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ABSTRACT

Background: Musculoskeletal disorders (MSDs) account between 42% and 58% of all work-related illnesses. These occur gradually and often go untreated due to their chronicity. These are multifactorial in origin having many risk factors which are amenable to change. So, this study was done to assess risk factors for the development of MSDs in different body regions among working women. **Objective:** To assess risk factors for the development of MSDs in different body regions among working women using Nordic scale. **Material and methods:** A cross sectional study was conducted among 196 working women in tertiary care hospital. A semi-structured questionnaire was used of which first part had demographic and work life details. Second part was Nordic scale. Data was analyzed using SPSS v20. **Results:** Most common MSDs among participants was low-back pain (58.2%) and least upper back (14.3%). Natures of job and comfort level at work were significantly associated with neck pain in last seven days and sleep disturbance was associated with neck pain in last twelve months. Sleep disturbance was found to be associated with low back pain in last seven days, whereas nature of job, working in static posture for long time was associated with back pain in last twelve months. Number of working hours per day ($p<0.001$) was associated with shoulder pain in last seven days and nature of job ($p=0.004$) as well as sleep disturbance ($p<0.001$) were associated with shoulder pain in last twelve months. Nature of job ($p<0.001$) was associated with knee pain in last seven days. Comfort level ($p<0.001$) and sleep disturbance ($p<0.001$) were associated with knee pain in last twelve months. **Conclusion:** Lower back pain was the most common musculoskeletal symptom among participants. Risk factors like nature of job, comfort level, sleep disturbance, working in static posture and number of working hours were associated with development of MSDs.

Key-words: Disorders, Musculoskeletal, Nordic scale, Risk Factors, Women, Working

INTRODUCTION

Musculoskeletal disorders (MSDs) are among the leading causes of occupational health problems, with consequences for workers, employers and society. These disorders are widespread in different countries with substantial costs and impact on the quality of life.¹

The World Health Organization (WHO) has characterized multifactorial risk factors that contribute to Work-related MSDs (WMSDs) among workers all over the world and will be leading cause of disability by 2020.²

MSDs contribute to 42% to 58% of all work-related illnesses and are the most frequent cause of all health-related absence from work.³

MSDs are inflammatory and degenerative conditions that affect the muscles, tendons, ligaments, joints, peripheral nerves and supporting blood vessels with consequent ache, pain or discomfort.⁴ MSDs are grouped under general terms such as repetitive strain injuries, cumulative trauma disorders and occupational overuse syndrome.

These disorders occur gradually, have a chronic course, and often go untreated. Typically, pain becomes progressively severe and loss of function occurs.⁵ The risks of MSDs can increase with low job satisfaction, high job demands, job stress and lack of support from peers and supervisors as well.⁶

Working women are two to five times more likely than men to report these sorts of problems, may thus reflect the accumulation of difference in exposures at work and at home, bringing out the relationships between work-related factors, domestic load and underlying biological differences.⁵ When women work with computers these factors get exaggerated as electronic data are mainly displayed on visual display terminals, improper body posture and prolonged sitting in front of these terminals can lead to many health hazards, including eye strain, muscle fatigue, and other musculoskeletal discomforts.³

Repetitious movements, awkward postures and high force levels are the three primary risk factors that have been

associated with WMSDs.² The risk of disorders is also directly related to the number, speed and frequency of movements as well as the amount of force exerted with each movement and non-neutral body postures.^{2,8} The WMSDs develop over a period of time and are not curable, however, suitable coping strategies can help in controlling the development of these disorders. With this background this study was undertaken to assess risk factors for the development of musculoskeletal disorders in different body regions among working women using Nordic scale.

MATERIAL AND METHODS

Study design and setting: A cross sectional study among working women in tertiary care hospital carried out for three months and ethical clearance was obtained from Institutional Ethical Committee.

Sampling method: The sample size calculated was 196, using the formula $4pq/L^2$, where p is the prevalence (33.8%),⁵ q = 1- p (66.2%) and L the permissible error, taken as 20% of p.

Study Tool: It consisted of two parts. First part included information such as age, years of job experience, job type, marital status, number of working hours per day, self-perceived comfort level at work, working in static posture for long time, number of hours of usage of computer, type of activity and sleep disturbance. Second part was Nordic scale which is a tool to assess self-reported musculoskeletal symptoms in nine body regions such as neck, shoulder, elbows, wrists/hands, upper back, lower back, hips, knees and ankles/feet over last one week and last 12 months. Nordic scale has pictorial representation of nine body areas. The study participants were asked to mark the area in which they had pain. Height and weight of study participants was recorded and BMI was calculated.

Data collection: Data was collected by taking written informed consent from the study participants on voluntary basis after using the pre-designed, pre-tested questionnaire and confidentiality of data collected was assured. Those women who were above 60 years of age, not willing to give consent and previously diagnosed of having MSDs were excluded. Data collection was scheduled with prior intimation as per their convenient timing and the questionnaire was distributed after explaining the pictorial diagram and any other queries related to the study.

Statistical analysis: Data was entered using Epidata v3.1 and analyzed using SPSS v20. Descriptive statistics like frequencies, percentages, mean and standard deviation were calculated. Chi square test was applied to determine the association between two categorical variables. P value less than 0.05 was considered statistically significant.

Total of 196 working women participated in the study. Mean age of participants was 33.64 ± 7.01 years and mean BMI was 23.37 ± 4.13 kg/m².

Table 1: Profile of working women (n=196)

Characteristics	Number	Percentage
Age in years		
20-25	20	10.2
26-30	59	30.1
31-35	42	21.4
36-40	38	19.4
41-45	31	15.8
46-50	6	3.1
Marital status		
Unmarried	30	15.3
Married	166	84.7
Job experience in years		
1-3	55	28.1
4-6	55	28.1
7-10	62	31.6
>10	24	12.2
Nature of job		
Sitting	95	48.5
Standing	2	1
Both	99	50.5
Number of working hours/day		
5-6 hrs	3	1.5
6-8 hrs	159	81.1
>8 hrs	34	17.3
Type of worker		
Sedentary	44	22.4
Moderate	152	77.6
Static posture at work		
Yes	129	65.8
No	67	34.2
Usage of computer in hours per day		
2-4	28	14.3
5-7	73	37.2
>8	95	48.5
Sleep disturbances		
Yes	61	31.1
No	135	68.9

Table 1 shows that 84.7% of the participants were married and as much as 30.1% of them were in the age group of 26 to 30 years. 31.6% had job experience of 7-10 years, 81.1% were working for 6-8 hours/day, 77.6% were doing moderate activity and 65.8% were working in static posture for longer time. 48.5% were using computer for more than 8 hour/day and 31.1% had complaints of sleep disturbance.

Table 2: Association of risk factors with neck pain

Variable	Present				Last 12 months				P+L*
	Pain	No pain	χ^2	p	Pain	No pain	χ^2	p	
Nature of Job									
Sitting	35(36.8)	60(63.2)	15.394	<0.001	30(31.6)	65(68.4)	16.108	<0.001	0.459
Both	13(13.1)	86(86.9)			13(13.1)	86(86.9)			
Comfort Level									
Comfort	48(27.6)	126(72.4)	8.037	0.005	45(25.9)	129(74.1)	7.385	0.007	<0.001
Un-comfort	2(9.09)	20(90.91)			2(9.09)	20(90.91)			
Sleep disturbed									
Yes	20(32.8)	41(67.2)	3.297	0.069	28(45.9)	33(54.1)	26.354	<0.001	<0.001
No	28(20.7)	107(79.3)			17(12.6)	118(87.4)			

*P+L – Pain in last seven days + last twelve months

Table 3: Association of risk factors with low back pain

Variable	Present				Last 12 months				P+L*
	Pain	No pain	χ^2	p	Pain	No pain	χ^2	p	
Nature of Job									
Sitting	24(25.3)	71(74.7)	1.667	0.434	50(52.6)	45(47.4)	21.863	<0.001	0.003
Both	31(31.3)	68(68.7)			21(21.2)	78(78.8)			
Static Posture									
Yes	36(27.9)	93(72.1)	0.004	0.947	64(49.6)	65(50.4)	29.278	<0.001	<0.001
No	19(28.4)	48(71.6)			07(10.4)	60(89.6)			
Sleep disturbance									
Yes	23(37.7)	38(62.3)	4.08	0.043	18(29.5)	43(70.5)	1.729	0.189	0.438
No	32(23.7)	103(76.3)			53(39.3)	82(60.7)			

*P+L – Pain in last seven days + last twelve month

Table 4: Association of risk factors with shoulder pain

Variable	Present				Last 12 months				P+L*
	Pain	No pain	χ^2	p	Pain	No pain	χ^2	p	
Nature of Job									
Sitting	29(30.5)	66(69.5)	2.053	0.358	21(22.1)	74(77.9)	10.83	0.004	0.003
Both	23(23.2)	76(76.8)			06(6.1)	93(93.9)			
Working hours									
05-06	1(33.3)	2(66.7)	15.411	<0.001	1(33.3)	2(66.7)	4.728	0.094	0.077
06-07	34(21.4)	125(78.6)			26(16.4)	133(83.6)			
>8	18(52.9)	16(47.1)			1(2.9)	33(97.1)			
Sleep disturbance									
Yes	13(21.3)	48(78.7)	1.238	0.266	20(32.8)	41(67.2)	26.949	<0.001	0.003
No	39(28.9)	96(71.1)			07(5.2)	128(94.8)			

*P+L – Pain in last seven days + last twelve months

Table 5: Association of risk factors with knee pain

Variable	Present				Last 12 months				P+L*
	Pain	No pain	χ^2	p	Pain	No pain	χ^2	p	
Nature of Job									
Sitting	30(31.6)	65(68.4)	15.084	<0.001	2(2.1)	93(97.8)	39.589	<0.001	0.008
Both	9(9.1)	90(90.9)			10(10.1)	89(89.9)			
Comfort Level									
Comfort	35(20.1)	139(79.9)	0.046	0.831	02(1.1)	172(98.9)	66.702	<0.001	<0.001
Un-comfort	04(18.2)	18(81.8)			10(45.5)	12(54.5)			
Sleep disturbed									
Yes	11(18.0)	50(82.0)	0.193	0.66	10(16.4)	51(83.6)	16.255	<0.001	0.071
No	28920.7)	107(79.3)			02(1.5)	133(98.5)			

*P+L – Pain in last seven days + last twelve months

Table 2 shows association of risk factors with neck pain. It was found that nature of job ($\chi^2=15.394$, $p<0.001$, $df=1$) and comfort level at work ($\chi^2=8.037$, $p=0.005$, $df=1$) were significantly associated with neck pain in last seven days whereas along with these factors sleep disturbance ($\chi^2=26.354$, $p<0.001$, $df=1$) was associated with neck pain in last twelve months. Also, comfort level ($p<0.001$) and sleep disturbance ($p<0.001$) was significantly associated with neck pain when pain in the last seven days and twelve months was considered together.

Sleep disturbance was found to be associated with low back pain ($\chi^2=4.080$, $p=0.043$, $df=1$) in last seven days but when pain was considered for last twelve months, nature of job ($\chi^2=21.863$, $p<0.001$, $df=1$) and working in static posture long time ($\chi^2=29.278$, $p<0.001$, $df=1$) were significantly associated with low back pain (table 3). When low back pain was taken together for last seven days and twelve months, it was seen that nature of job ($p<0.003$) and static posture ($p<0.001$) were found to be significantly associated with it.

Table 4 shows association of risk factors with shoulder pain. Number of working hours per day ($\chi^2=15.411$, $p<0.001$, $df=2$) was associated with shoulder pain in last seven days. But nature of job ($\chi^2=10.830$, $p=0.004$, $df=2$) and sleep disturbance ($\chi^2=26.949$, $p<0.001$, $df=1$) were significantly associated with development of shoulder pain in last twelve months. However, nature of job ($p=0.003$) and sleep disturbance ($p=0.003$) were associated with present and twelve months shoulder pain.

Nature of job ($\chi^2=15.084$, $p<0.001$, $df=1$) was also significantly associated with knee pain in last seven days. All three factors namely nature of job ($\chi^2=39.589$, $p<0.001$, $df=1$), comfort level ($\chi^2=66.702$, $p<0.001$, $df=1$) and sleep disturbance ($\chi^2=16.255$, $p<0.001$, $df=1$) were associated with knee pain in last twelve months (table 5). But when the knee pain was considered together for seven days and twelve months, it was associated with nature of job ($p=0.008$) and comfort level ($p<0.001$)

Overall, most common MSDs among participants was low-back pain (58.2%), followed by neck pain (42.9%), shoulder (38.8%), knees (26.0%), wrist (20.4%), hips and thighs (19.4%), elbows (18.9%), ankles (18.4%), and least pain was noted in upper back (14.3%).

DISCUSSION

Present study was intended to assess risk factors for the development of musculoskeletal disorders among working women. Most common MSD found among participants was low-back pain (58.2%), followed by neck pain (42.9%), shoulder (38.8%), knees (26.0%), wrist (20.4%), hips and thighs (19.4%), elbows (18.9%), ankles (18.4%), and least pain was noted in upper back (14.3%).

Lower back pain (58.2%) and Upper back (14.3%) pain were most common and least common MSDs in our

study. This finding was similar to a study in Tamil Nadu³ in which lower back symptoms were most common (51.8%) and ankle/knee related MSDs were least common (18.3%). This was in contrast to a multi-centric study done in India⁹ where low back pain was found only in 25.3% of office going women. This finding was also similar to a study done in South West Nigeria¹⁰ and Vellore¹¹, where low backache was the most common MSD among nurses, as much as 44.1% and 31.3% respectively

In our study shoulder pain was found in 38.8% of study participants, which was in variance with a study done in Malaysia¹², in which shoulder pain was seen among 25.4% women doing plantation work and also study done in Hyderabad⁴, among female construction workers where only 12.6% had shoulder pain. Occurrence of shoulder pain in our study may be more due to office table work and usage of computer which have a greater impact on shoulder pain.

As much as 42.9% of study participants in our study had neck pain which was more compared to a multi-centric study done in India¹³ among IT employees, where neck pain was found to be 30%. It was also more, when compared to study conducted in Gujarat, where neck pain was found among 34.5% of nurses¹⁴. The difference in this finding could be due to nature of job, comfort level of work and disturbed sleep at night found to be significant factors in our study.

In our study nature of job was significantly associated with neck and knee pain in the last seven days also with low-back pain and shoulder pain in the last twelve months. It was found to be an important risk factor for development of MSDs in any body part as sitting while working has impact on lower back, doing table work predisposes to shoulder pain due to prolonged shrugging. Self-perceived comfort level was associated with knee pain in last seven days along with neck and knee pain in last twelve months. This is due to uncomfortable posture during work or may even be psychological discomfort as a part of low job satisfaction.

The major strength of study is most of the aspects of work, which may lead to MSDs were included such as nature of job, comfort level, number of working hours, usage of computers, static posture and sleep disturbance. The study was limited to women working in a tertiary care hospital, hence results cannot be generalized. Further community based studies can be carried out on large sample size.

Conclusion:

Lower back pain was the most common musculoskeletal symptom encountered among study participants. Nature of job, comfort level, sleep disturbance, working in static posture for long time and number of working hours were found to be the risk factors for development of musculoskeletal disorders either in last seven days or

twelve months. Therefore Nordic scale is a useful tool to screen working women for MSDs so that detection is done at the earliest, so that preventive measures can be instituted early to prevent disabilities.

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Socio-demographic Determinants and Perception of Family Planning Practices among Eligible Couples in Urban Field Practice area of a Medical College, Mysuru

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ABSTRACT

Background: The Child bearing and the use of contraceptives are some of the most important decisions on reproduction that could be taken by couples to curtail the number of children they want to have. The issue of family planning and its methods has led many couples to either accept or reject family planning services. The need for studies to understand the factors determining the fertility and family planning acceptance and practices by particular communities has been felt, so that more specific knowledge ; can be gained about factors determining family planning acceptance by particular communities. **Objectives:** To assess the socio-demographic determinants influencing the use of family planning methods among eligible couples; To assess the knowledge, attitude and practices of family planning methods among eligible couples; To explore the factors militating against acceptance of family planning methods among eligible couples. **Results:** The mean age of the participants was 31 ± 7 SD and mean age at marriage was 18.6 ± 2 SD. About 57 (53.8%) of the participants had good knowledge about female sterilization. 53 (50%) of eligible couples had spacing less than 3years between 1st and the 2nd child. Unmet need for contraception, (30.2%) women reported, (17.9%) need for spacing and need for limiting birth in (12.3%) women. **Conclusion:** The unmet needs of family planning is the need of the hour in the study and gender inequity is also observed with respect to the need of male child in the family.

Key-words: Eligible couple, family planning, unmet need

INTRODUCTION

The practice of family planning has called for global attention because of its importance in decision making on population growth and issues of development.¹ WHO defined family planning as "a way of thinking and living that is adopted voluntarily, upon the basis of knowledge, attitudes and responsible decisions by individuals and couples, in order to promote the health and welfare of the family group and thus contribute effectively to the social development of the country".²

India became the first country to launch a family planning programme in 1952.³ In spite of this programme population has increased from 350 million during independence to 1,210 million by 2011.⁴

One of the major causes of burgeoning population is uncontrolled fertility. Nearly 10% of all pregnancies are mistimed and 11% of all pregnancies are unwanted in India.⁵ Uncontrolled fertility also poses a greater risk to both the mother as well as the child. With almost half the population of India being in reproductive age group, adoption of family planning methods will play an important role in stabilizing the population. Family planning will also help in avoiding unwanted pregnancies, reduce maternal and neonatal deaths and also reduce maternal morbidity, infant mortality and under 5 mortality

rate. The National Population policy 2000 states that the immediate objective is to address the unmet need for contraceptive services.⁶ The concept of unmet need points to the gap between these women's reproductive intentions and contraceptive behaviour. In doing so, it poses a challenge to family planning programme of reaching and serving millions of women whose reproductive attitude resemble those of contraceptive users but due to a combination of reasons, they are not using contraception.⁷ According to the national family health survey done in Karnataka, in comparison between NFHS 3 and NFHS 4, shows a drastic decline in utilization of family planning methods.⁸ The prevalence of contraceptive use is not uniform across the country. Though family planning services are offered free of cost, only 53.5% population currently uses contraceptive methods with an unmet need of 12.9%. In Karnataka, the usage of contraceptive is 48% in urban areas with an unmet need of 12.6%. The Child bearing and the use of contraceptives are some of the most important decisions on reproduction that could be taken by couples to curtail the number of children they want to have and improve the quality of life of women. This study therefore, undertaken to assess the socio-demographic determinants influencing the use of family planning methods among eligible

couples, to assess the knowledge, attitude and practices and to explore the factors militating against acceptance of family planning methods among eligible couples in an Urban field practice area.

METHODOLOGY

A cross-sectional community based study done among 106 eligible couples in Urban field practice area, Department of Community Medicine, JSSMC, Mysuru for a period of 3 months. All the eligible couples residing in the urban field practice area were taken into the study based on the eligible couple registry available in the area and a total of **106** eligible couples were interviewed. **Inclusion criteria:** Eligible couples (15-45 years), Pregnant and Post-partum women (within 42 days of delivery) who were willing to participate. **Exclusion criteria:** Houses were locked even after three times of re-visit, houses were both the spouses were not available, widow and widower and non-cooperative women who refused to furnish necessary information. After obtained informed consent, data was collected by a pretested, semi-structured interview schedule questionnaire. The questionnaire was thoroughly revised based on the feedback gathered from the peer reviewers before the finalized questionnaire was used for the study. The couples were cross checked with the medical records for the use of various contraceptive methods like copper T, tubectomy. Eligible couples were interviewed with respect to the socio-economic status, educational status, age at marriage, married life, total number of children, usage of contraceptive methods, reasons for non-usage. Descriptive statistical measures like percentages were used for qualitative data and quantitative data were expressed as mean and standard deviation. Appropriate statistical tests and Inferential Statistics were using SPSS Version 22 software. The differences and association were expressed statistically at p-value less than 0.05.

RESULTS

Among 106 participants, the mean age of the participants was 31 ± 7 SD and mean age at marriage was 18.6 ± 2 SD. Among the eligible couples, 51 (48.1%) of them had two children and 27 (25.5%) of them had 3 children. Among the eligible couples, about 28 (26.4%) of females had completed their primary schooling whereas 68 (64.2%) of males were illiterate. Sixty one (57.5%) of the participants belonged to Class V socioeconomic status according to B.G.Prasad classification. (Table 1)

Family planning knowledge and source: Here 57 (53.8%) of the participants had good knowledge about female sterilization and 27(25.5%) about traditional methods. 68 (64.2%) of them were self-determined about the decision of family planning methods whereas in 27(25.5%) participants husband was the person to decide. The major source of knowledge of 45.3% was from other sources like family members, neighbours, relatives and friends followed by 40.6% was from doctors.(Table 2,3)

Table 1: Socio-demographic determinants

Socio-demographic determinants	No. of Participants (%)	
Age (in Years)		
15 - 25	29 (27.4 %)	
26 - 35	45 (42.5%)	
36 - 45	32 (34.7%)	
Parity		
1	19 (17.9%)	
2	51 (48.1%)	
3	27 (25.5%)	
4 & more	5 (4.7%)	
Religion		
Hindu	96 (90.6%)	
Muslim	6 (5.7%)	
Christian	4 (3.8%)	
Education	Wife	Husband
Non literate	36 (34%)	68 (64.2%)
Primary	28 (26.4%)	9 (8.5%)
Middle (5-7 th std)	27 (25.5%)	18 (17%)
Higher school	12 (11.3%)	10 (9.4%)
PU/Diploma and more	3 (2.8%)	1 (0.9%)
Socio economic status		
Class I	41 (38.7%)	
Class IV	4 (3.8%)	
Class V	61 (57.5%)	

Numbers in brackets indicate row percentage.

Table 2: Knowledge, Attitude and Practice of Family Planning Methods

Knowledge about Family planning method (s)	No. of Participants (%)
Female sterilization	57 (53.8%)
Male sterilization	-
Pills	7 (6.6%)
IUCD	3 (2.8%)
Condoms	-
Traditional methods	27 (25.5%)
None	4 (3.8%)
More than one choice	8 (7.5%)
Family planning method: Attitude	No. of Participants (%)
Approve	69 (65.1%)
Disapprove	21 (19.8%)
Do not know	16 (15.1%)
Current use/ Practice	No. of Participants
Sterilization	54 (50.9%)
IUCD	5 (4.7%)
OCP	5 (4.7%)
Condom	-
None	42 (39.6%)

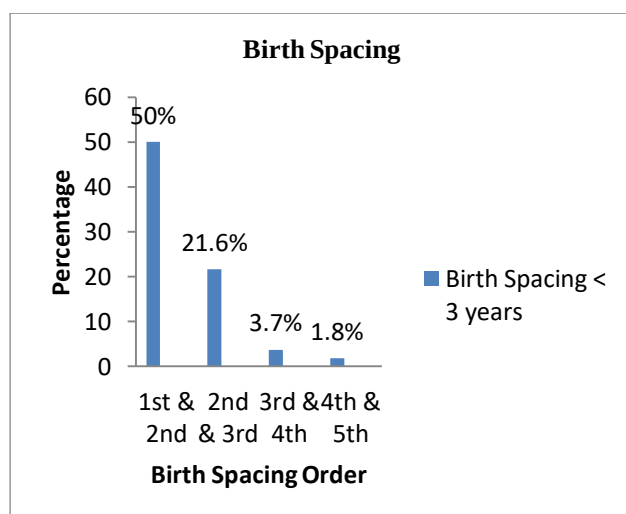
Numbers in brackets indicate row percentage.

Table 3: Satisfaction level of current use and Source of knowledge of Family planning methods (FPM)

Satisfaction level of current use of FPM	No. of Participants (%)
Satisfied	62 (58.5%)
Likely to change	3 (2.8%)
Do not know / want to use	41 (38.7%)
Source of knowledge about FPM	No. of Participants (%)
Television	1 (0.9%)
Doctors	43 (40.6%)
Health workers	5 (4.7%)
Other sources(Friends and family)	48 (45.3%)
More than one source	9 (8.4%)

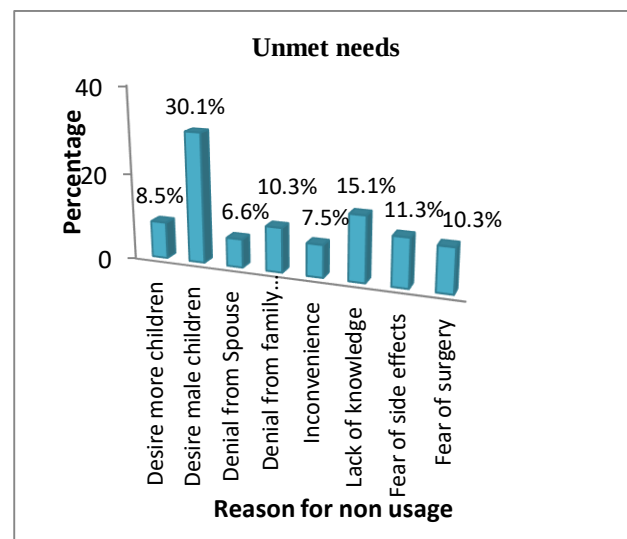
Table 4: Distribution of study population based on past and future use of contraceptives

Family planning methods: Used in past	No. of Participants (%)
Pills	5 (4.7%)
IUCD	5 (4.7%)
Condom	-
Injectables	-
Traditional methods	2 (1.9%)
None	94 (88.7%)
Family planning method preferred for future use	
Female sterilization	13 (12.3%)
Male sterilization	-
Pills	2 (1.9%)
IUCD	5 (4.7%)
Condom	-
Other modern method	-
Traditional method	-
Unsure of method	50 (47.2%)

Fig 1: Distribution of study population based on practice of birth spacing

Attitude and satisfaction level: Here 69 (65.1%) of them had approved for usage of family planning methods and

54 (50.9%) of them had already undergone tubectomy. Sixty two (58.5%) of them were satisfied with their currently practiced family planning method whereas 41 (38.7%) of them did not want to use any methods as they believed they can combat pregnancy by traditional methods like withdrawal methods and there was no need socioeconomic any kind of intervention needed and few said that it is against their cultural norms. (Table 2,3)

Fig 2: Distribution of study population based on Unmet needs of family planning**Table 5: Association of Literacy level in females, Current practice and Knowledge of Contraception**

Variable	Category	Knowledge			P Value*
		Good	Poor	Total	
Education (Wife)	Non literate	14(38.9)	22(61.1)	36	<0.001
	Primary	24(85.7)	4(14.3)	28	
	Middle	19(70.4)	8(29.6)	27	
	Higher	14(93.3)	1(6.7)	15	
Current Practice	Sterilization	30(55.6)	24(44.4)	54	0.028
	IUCD	5(100)	0	5	
	OCP	5(100)	0	5	
	None	31(73.8)	11(26.2)	42	

Family planning used in past and future use: About 94 (88.7%) of them did not use any type of family planning methods in past and 50 (47.2%) of them are unsure of any methods due to ignorance, illiteracy, traditional values and norms, husband dominance among others have come against the practice of family planning among married women, whereas 13 (12.3%) said that they will opt for female sterilization and 5 (4.7%) of them preferred IUCD.(Table 4)

Birth Spacing: About 53 (50%) of eligible couples had spacing less than three years between First and the second child and 23 (21.6%) of them between second and third child, four (3.7%) of them between third and fourth child and two (1.8%) of them between fourth and fifth child had spacing less than three years. Majority of the couples quoted the want of male child as the reason for having more than two kids and also this was the reason for not

opting for any family planning methods. Among the participants, came across a family of five kids, wherein first, four children were females with the birth spacing of one year each and the fifth child was a male, after which they opted for tubectomy.(Fig 1)

Unmet needs: About 32(30.2%) women reported unmet need for contraception among whom, 19(17.9%) need for spacing and need for limiting birth in 13(12.3%) women.(Fig 2). It was found in this study that higher the education of females, more is the knowledge (p value <0.001) and practice(p value 0.028) of family planning methods which was found to be statistically significant.(Table 5)

DISCUSSION

In the present study in terms of parity, about 48.1% of them have two children and 25.5% have three children and 4.7% have four or more children was almost similar to the study done by Koringa H et al² where 42.4% had two children and 25.5% have three+ children and Sharma V et al.⁹

The literacy rate has been observed to be higher among women than that of the men in this study. When compared with the study done by Koringa H et al¹⁰, the percentage of non-literates are higher in our study (34%) by about 6.7% whereas the percentage of women with higher education and above are similar in both the studies.

In this study, only 3.8% did not have any knowledge about contraception whereas it was 7.2% in Hemavarneshwari S et al¹¹ and Renjhen Prachi et al⁸ study where it was observed that 6% of women did not have knowledge about family planning. Majority of the women had knowledge about female sterilization 57 (53.8%) which was slightly lower than in Hemavarneshwari S et al¹¹ i.e,151(64.3%), and the study by Srivastava et al¹³ where knowledge about tubectomy was 67%.

Present study revealed a high percentage of awareness of family planning methods, 96.2% with 7.5% of them knew about more than one method when compared with 93.1% of the respondents knew about at least one method in Jahan U et al.¹⁴ In our study main source of information was by friends and relatives 45.3% and doctors 40.6% and only 8.4% by multiple sources and only 4.7% from health workers.

In this study, about 69 (65.1%) of the couple approve for contraceptive usage and 54 (50.9%) were already tubectomized. Study done in Bangladesh, Riley AP et al similarly reported 99% of the women having knowledge of female sterilisation and only 83.0% for male sterilisation.¹⁵ This disparity may be because of general concept of laymen that reproduction is mainly the function of women.

Desire for male child 30.1% was the main reason for non-acceptance of family planning, 10.3% women there was opposition by the partner which was higher than Hemavarneshwari S et al¹¹(26.8%), and also 7.2%, in the study by Kumar S et al study.¹⁶ Rama et al noted that in 12% of women, the reason for non-acceptance of family planning was opposition from husband, families and communities.¹⁷

In this study, 30.2% women reported unmet need for contraception among whom, (17.9%) need for spacing and need for limiting birth in (12.3%) women.

A community based cross sectional study done in Aurangabad, found that 20.54% of study subjects had unmet need for contraception, 3.61% for spacing births and 16.93% for limiting births. The main reasons for unmet need were, little perceived risk of pregnancy due to pre-menopausal age (32.47%), lactation (31.16%) and ignorance (12.32%).¹⁸ Patil SS reported unmet need for contraception in 59 (45.1%) women, need for spacing in 25 (19.1%) and need for limiting birth in 34 (26%) women.¹⁹

The concept of unmet need points to the gap between these women's reproductive intentions and contraceptive behaviour. In doing so, it poses a challenge to family planning programme of reaching and serving millions of women whose reproductive attitude resemble those of contraceptive users but due to a combination of reasons, they are not using contraception.²⁰

It was noted in this study that 50% of the women had less than three years of birth spacing between their first and the second child, and 21.6% between the second and third and 3.7% between third and fourth respectively.

The interval between the previous birth and the current birth shows a strong negative effect on infant and child mortality rates. When a birth occurs less than two years after an earlier birth, the infant mortality rate is 86. If the interval is 24-35 months, the infant mortality rate is 50, and if the interval is 36-47 months, it is only 30. But when the interval is four years or more, the infant mortality rate is somewhat higher about 37. This pattern is observed for both neonatal and post neonatal mortality rates. Child mortality, however, is negatively related to the previous birth interval throughout, with mortality being lowest for intervals of four years or more.²¹

Strengths and Limitations of study

In the present study, the history regarding current and past usage of contraceptive methods were cross verified and confirmed from the medical records available with eligible couples. Limitations of study is the inherent recall bias could not be eliminated in those who did not have the records. Comparison between various studies shows many findings close to the present observations. This study therefore, adds to the existing literature of utilization of contraceptive methods and unmet needs of contraception.

Conclusion and Recommendation

This study highlights the need for a constant interaction of health functionaries with eligible couples for boosting family planning program. Even though we see the women in the family are more educated than the men, even in terms of knowledge than their other family members about family planning, still the decision making of birth control and spacing lies in the hands of their husband and mother in law who have comparatively lesser knowledge. The unmet needs of family planning is the need of the hour and gender inequity is also observed with respect to the need of a male child in the family. Therefore, in this study decision making does not necessarily depend on the education level.

Efforts should be made to educate and promote spousal discussion and also education to the whole family about the utilization of IUCDs, OCPs and condoms which are the reversible methods of contraception and also increasing male participation and promoting Non scalpel vasectomy.

Family planning counselling needs to be universally included into routine antenatal clinic activities in respect to availability, accessibility, affordability and acceptability of services.

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Prevalence of Childhood Obesity among the School Children of Sakaka, Aljouf.

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ABSTRACT

Introduction: Childhood overweight and obesity is one of the most common public health problems in the Kingdom of Saudi Arabia and the world. There is increasing trend of childhood obesity in the Kingdom. **Objectives:** To determine prevalence and risk factor for childhood overweight and obesity among primary school children of Sakaka. **Materials and Methods:** Primary school children from different schools of Sakaka were randomly selected by using stratified random sampling technique. World Health Organization Growth Chart for the children aged 5 – 19 years were used to assess overweight and obesity status. SPSS version 18 was used for data analysis. **Results:** Out of 166 studied population, the prevalence rate of overweight among primary school students was 9.7% and that for obesity was 19%. Children with parents of high education, Watching TV, using computer, or playing video games more than 4 hours per day, children of obese mother had significantly ($p < 0.05$) more risk of developing overweight and Obesity. **Discussion:** This study prevalence is support the previous findings which stated that the prevalence of overweight among male school children 6-12 years was 7.3% while that of obesity was 17.4%. **Recommendation:** We must plan to provide family-oriented, lifestyle and weight management programs for children and young people who are obese and overweight.

Key word: Obesity, school children, overweight, Sakaka, Aljouf.

INTRODUCTION

Childhood overweight and obesity is one of the most common public health problems in the Kingdom of Saudi Arabia and the world [1]. The World Health Organization (WHO) states that in 2014 there were around 41 million children under 5 years of age are obese [1]. Data from National Health and Nutrition Examination Survey (NHANES) surveys, which was done in different period of time (1976-1980 and 2003-2004) showed that the prevalence of overweight is increasing: For children of age group 2-5 years, the prevalence has increased from 5% to 18.8%.[2]

The prevalence of overweight and obesity among Saudi boys increased from 8.6% and 4% in 1994 [3] to 7.3% and 17.4% respectively in 2014[4]. There are several studies [5 – 9] in the Kingdom of Saudi Arabia indicated the same trend in the past two decades.

Obesity and overweight is not a single disease but is a syndrome with multifactorial causes that includes metabolic, genetic, environmental, social, and cultural interaction.[10]

The World Health Organization (WHO) in their fact sheets [1] stated the following: The basic cause of obesity and overweight is due to an energy imbalance between calories intake and calories expended. Worldwide, there has been an increased intake of high caloric foods that are rich in fat; and an decrease in physical activity

contributed by increasingly sedentary lifestyle, change in modes of transportation.

These changes in nutritional and physical activity patterns are mainly the result of environmental and societal changes linked with development and lack of adequate policies in sectors such as health, agriculture, transport, urban planning, environment, food processing, distribution, marketing, and education.

The most important health consequences of childhood overweight and obesity, that mostly do not become noticeable until adulthood, include: cardiovascular problems (mainly heart disease and stroke); diabetes mellitus; musculoskeletal disorders like osteoarthritis; and some types of cancer (endometrial, breast and colon) [11]. Childhood is an important period for the origin of obesity and its associated morbidity. Obesity at any age may increase the persistence at subsequent ages; It was found in at least two studies [12, 13] The found more than half of all obese children remained obese as adults. The family and home environment are often implicated in the development of childhood obesity.

A number of studies highlighted the association between environmental factors, mainly factors related to sedentary lifestyle (like eating unhealthy food or physical inactivity) and childhood obesity.[14]

Low level of physical activity in children is also influenced by the amount of physical activity undertaken by parents. Children with active parents were six times more likely to be active compared with parents who are not active.[15]

Time spent on watching TV or computer screens and video games appears to be an important index of sedentariness which could increase the risk of obesity.[16,17] Reducing television viewing and computer use may have an important role in preventing obesity and in lowering body mass index (BMI) in young children.[18] Recent studies also showed that short sleep duration may be a risk factor for obesity in children.[19, 20]

Objectives of this study were to determine the prevalence of overweight and obesity among the primary school children of sakaka, Saudi Arabia and to identify the risk factors for the childhood overweight and obesity among them.

MATERIAL & METHODS

This study was a cross Sectional Study and it was conducted among different schools of Sakaka city, Saudi Arabia. Study subjects were primary school children. Only male students were included in this study. The sample size calculated based study done by Al Dahi et al [4]. on prevalence of childhood obesity (17.8%). The sample size was calculated by using the formula $n = (1.96)^2 pq/d^2$. Here, p is the expected prevalence (17.8%) q is $(100-17.8 = 82.2\%)$ and d is precision = 0.05 (95% confidence interval). Sample size $(n) = (1.96)^2 \times 0.178 \times 0.822 / 0.05 \times 0.05 = 224$. Stratified sampling method was used to select the students. In the first stage, a sample of four primary schools from Sakaka were selected through simple random technique. In the second stage, stratified sampling technique was used. Each grade of a selected school was treated as stratum; the sample from each stratum were equally selected by systematic random technique from students list, i.e. by selecting the odd numbers from the students list. The selection of the students from that particular grade was stopped once they reach required sample from that grade.

Tool for data collection: Survey questionnaire were pre-tested before the survey through pilot study

Study questionnaire: It was translated into Arabic be given to students to get completed by their parents. It has several socio demographic factors

Body Mass Index Assessment: Height and Weight of the selected students were measured with standard and calibrated height and weighing scale.

$$\text{Formula for BMI} = \frac{\text{Weight (in Kgs)}}{\text{Height (in meters)}^2}$$

Nutritional status assessment: This was done based on World Health Organization Growth Chart for the children aged 5 – 19 years [21]

First step, the mean BMI of the study population were measured **Normal:** Students with BMI between –2 SD and +1 SD (from mean) were defined as normal.

Overweight: Students with BMI between +1 SD and +2 SD were defined as overweight.

Obesity: Students with BMI above +2 SD (from the mean) were defined as obese.

Ethical approval: This study proposal/synopsis was submitted to research committee of college of medicine. The data for this study were collected after necessary approval and consent.

Analysis of data Statistical Package for Social Science (SPSS), version 18 was used to enter and analyze data. Chi-square test was used to identify the significant factors associated with the prevalence of overweight and obesity. A P value less than 0.05 was considered statistically significant.

RESULTS

This study was done among two randomly selected primary school of Sakaka. The total number of participants responded for this survey was 166 (Out of 224 selected sample size). Hence the response rate for this survey was 74.1%.

Table 1: Socio – Demographic Details of study population (n = 165)

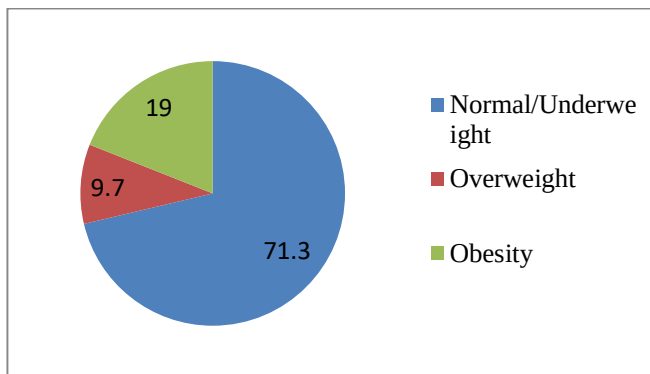
Characteristics	No	%
<u>Age group (in years)</u> (9.7±2.1)		
6 - 9	76	46.2
10 – 13	89	53.8
<u>Father's education</u>	82	49.5
Secondary school or lower	83	50.5
Bachelor or above		
<u>Mother's education</u>		
Secondary school or lower	99	59.8
Bachelor or above	66	40.2
<u>Family size</u>		
≤6	70	42.6
>6	95	57.4
<u>Watching TV, using computer, or playing video games per day</u>	65	39.6
≤4 hours	100	60.4
>4 hours		
<u>Duration of sleeping per day</u>		
≤8 hours	145	87.6
>8 hours	20	12.4
<u>Paternal obesity</u>		
No	122	73.7
Yes	43	10.3
<u>Maternal obesity</u>		
No	114	68.9
Yes	51	31.1

The mean age of the sample population is 9.7 ± 2.1 years. Table 1 also presents the study participants' socio-demographic profile and lifestyle factors.

Regarding the age group, 53.8% of the students are 10-13 years. About half (50.5%) of the children were born to a

father who has completed bachelor degree or/and higher. But this proportion (40.2) was less regarding mothers' education. This study also found that 57% of study participants' family size is more than 6.

Figure 1. Nutritional status of study participants



In the sample studied, the prevalence rate of overweight among primary school students was 9.7% and that for obesity was 19% (Fig 1)

Table 2. Risk factors for overweight and Obesity

Characteristics	Overweight No (%)	Obesity No (%)	p value
Age group (in years)			
6 - 9	18 (11.8)	28 (18.3)	0.666
10 – 13	14 (9.6)	35 (15.1)	
Father's education			
Secondary school or lower	18 (11.0)	22 (13.4)	0.008
Bachelor or above	14 (8.4)	41 (24.6)	
Mother's education			
Secondary school or lower	18 (9.1)	34 (17.2)	0.018
Bachelor or above	14 (10.5)	29(21.8)	
Family size			
≤6	11(7.8)	37 (16.2)	0.07
>6	21(11.1)	26(13.7)	
Watching TV, using computer, or playing video games per day			
≤4 hours	9 (9.6)	29 (22.1)	0.005
>4 hours	23(12.3)	34(17.0)	
Duration of sleeping per day			
≤8 hours	29 (10)	56(19.3)	0.678
>8 hours	3(7.3)	7(17.1)	
Paternal obesity			
No	16 (8.4)	41(21.6)	0.477
Yes	16 (15.6)	22 (15.6)	
Maternal obesity			
No	26 (9.7)	48 (17.8)	0.01
Yes	6 (9.7)	15 (24.2)	

The present study revealed that the children with the following characteristics had significantly ($p<0.05$) more

risk of developing overweight and Obesity: Children with parents of high education, Watching TV, using computer, or playing video games more than 4 hours per day, children of obese mother. (Table 2)

DISCUSSION

The current study was aimed to assess the prevalence and risk factors for overweight and obesity among primary school children of Sakaka city of Aljouf.

The present study found there is considerable prevalence of overweight (9.7%) and obesity (19) among primary school children. This study prevalence is support the previous findings which stated that the prevalence of overweight among male school children 6-12 years was 7.3% while that of obesity was 17.4%. [4] Also this study findings are similar to study done in several part of KSA [5-8].

Alhazmi et al[3] conducted a cross-sectional national epidemiological household survey in different areas of Saudi Arabia from 1994 to 1998. In their study the prevalence of overweight among boys aged 6-12 years was 8.6%while the prevalence of obesity was 4.9%. This indicates there is alarming increase in childhood overweight and obesity from in last two decades.

In the present study, a significant association was observed between students' obesity and high paternal education. This is similar to study conducted in KSA and other parts of middle east [4-7].

But studies done in France and German by Brwonell et al[12] found that paternal education do not have significant impact on childhood obesity and overweight. This may be mostly due to difference in cultural factor.

Watching TV, using computer, or playing video games more than 4 hours per day is one of the important risk factors identified in our study. But it contradicts from study done by Alenzy et al [4].

Recommendations:

1. Health education sessions to be conducted for parents with the special focus on targeted group (high risk group)
2. We must plan to provide family-oriented, lifestyle and weight management programs for children and young people who are obese and overweight.
3. Also, Integrate the guidance for non-communicable disease prevention in school curriculum
4. Students must be encouraged to play outdoor games and limit the time spent on watching TV, using computers or playing video games.

Limitations:

1. Dietary factors and physical activities are not collected (As they can be collected accurately from parents).
2. Paternal nutritional status (Height and Weight) are not measured directly (as we have taken only reported weight)
These are not done in this present study due to time constraints. Attempt will be made in next academic year to collect the relevant data for further analysis.

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ASSESSMENT OF QUALITY OF SLEEP AMONG MEDICAL STUDENTS OF A PRIVATE MEDICAL COLLEGE, TUMKUR, KARNATAKA.

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ABSTRACT

Background: Introduction: Sleep is a physiological process essential to life. Its quality is strongly related to psychological and physical health and other measures of well-being¹. Medical students, in particular, are often thought to have less free time, longer courses, and longer working hours than most of their fellow non-medical peers². This study was conducted with the objectives to assess quality of sleep among medical students and to assess the association between socio-demographic variables and sleep quality. **Materials and methods:** It is a cross sectional study conducted amongst the medical students of Sri Siddhartha Medical College, Tumkur between January 2017 to July 2017. A self-reported questionnaire: the Pittsburgh sleep quality index (PSQI) by Buysse was used. Data was collected from 200 students. **Results:** The mean age of the participants was 19.8 with the standard deviation of 2.346. Out of 200 students 99 (49.5%) belong to normal PSQI score and 101 (50.5%) belong to poor PSQI score. Out of 100 female participants 49 (49.0%) were normal while 51(51.0%) have poor PSQI out of 100 males 50(50.0%) males have normal while 50(50%) have poor global PSQI score. There was no significant association between gender, age and global PSQI score after applying chi square test ($p > 0.05$). **Conclusion:** The high prevalence rate of poor quality of sleep among medical students shows that further follow-up is needed and also there is need to create awareness among medical students regarding sleep quality.

Key-words: Sleep quality, Medical students, PSQI, India.

INTRODUCTION

Sleep is a physiological process essential to life. Its quality is strongly related to psychological and physical health and other measures of well-being¹. It is well documented that once in college, students find themselves cutting back on their sleep, in an effort to adjust and cope with their newfound workloads. Medical students, in particular, are often thought to have less free time, longer courses, and longer working hours than most of their fellow non-medical peers. A few studies, including a systematic review published in 2006, corroborate these claims and show an increased incidence of stress and burnout among medical students Sleep plays very important role in health of an individual². Sleep problems are common in the general population, and approximately one-third of adults report some form of insomnia^{3, 4}. Evidences have shown the linkage of poor sleep with cardiovascular disease, stroke, diabetes, metabolic dysfunctions⁵⁻⁷. Medical students carry a large academic load which could potentially contribute to poor sleep quality above and beyond that already experienced by modern society⁸. Medical students are one subgroup of the general population who appear to be especially vulnerable to poor sleep, perhaps due to the long duration and high intensity of study, clinical duties that include overnight on-call duties, work that can be emotionally

challenging, and lifestyle choices.⁴ Research on sleep disturbances in undergraduate medical students is of particular interest because of the known relationship between sleep and mental health and the concern that the academic demands of medical training can cause significant stress. Any additional undiagnosed sleep problem can presumably exacerbate mental stress in these students with potential long term consequences for both individual's health and the overall performance of the health care system.⁸ Medical students, in particular, are often thought to have less free time, longer courses, and longer working hours than most of their fellow non-medical peers². Different studies conducted in different parts of the world show high prevalence of sleep problems among medical students and its association with the academic performance and stress⁸⁻¹¹.

Poor sleep quality remains a recurring feature of student life. Not only does sleep affect cognitive processes but is also key to the recovery from stress and elimination of fatigue. Any impairment in sleep, both psychological and physical, has been implicated in an increase in burnout.² The habit of sleeping late and sleeping less was more among medical students due to increased academic demands leading to effects on their

health. There is paucity of such data in the state, and the literature review does not reveal many such studies from our area. In view of addressing the demand for this need, this study was undertaken with the objectives to assess quality of sleep among medical students and to assess the association of various socio-demographic variables and sleep quality.

METHODS

This cross-sectional study was carried out in Shree Siddharta Medical College, Tumkur Karnataka during the month of January 2017 to July 2017. Data was collected through a self-reported questionnaire the Pittsburgh sleep quality index (PSQI) by Buysse.

The sample size was calculated using a study done by Shad R et.al² by using the formula $4pq/d^2$ where p is prevalence, 62.6 45.5%, q = 100 – p and d is allowable error of 10%, which was found to be minimum of 90 subjects. A total of 200 subjects were studied out of them hundred were male and hundred were female students of age 18-25 years studying in Sri Siddhartha medical college. Informed consent was taken from the participants. Data were collected during the time when students were free from their classes after taking permission from college authorities. Pittsburgh Sleep Quality Index (PSQI) - It is a self-administered questionnaire used to assess sleep quality in last 1 month. It gives a combined PSQI score that ranges from 0 to 21, and a higher score is indicative of poorer sleep quality. Scores less than or equal to 5 were associated with good sleep quality and score more than 5 were considered as poor sleep quality. Students who were having past history of sleep disorders and currently using sedative medications were excluded from the study.

Data were compiled in an Excel worksheet. The data were analyzed by using SPSS software, version 21.0. Descriptive statistics including frequency, percentage, mean, standard deviation, and chi square-test, was used to observe the association between dental caries and other variables such as age, sex. A P-value less than 0.05 was considered statistically significant.

RESULTS

Two hundred medical students were involved in the study. Out of two hundred participants 123 (61.5%) belong to 17-19 years of age, 41 (20.5%) belong to 20-22 years of age and 36(18.0%) belong to ≥ 23 years of age; the mean age being 19.80 and standard deviation of 2.346 as shown in Table 1.

Table 1: Distribution of Study Population Based on Age Group

Age	Frequency	Percentage
17-19	123	61.5
20-22	41	20.5
≥ 23	36	18
Total	200	100

Table 2: Distribution of Study Population Based on Global PSQI Score

PQSI score	Frequency	Percentage
Normal	99	49.5
Poor	101	50.5
Total	200	100

Out of 200 participants 99 (49.5%) belong to normal PSQI score and 101 (50.5%) belong to poor PSQI score. The mean global PSQI score was 5.19 with standard deviation of 2.990 as shown in Table2.

Table 3: Association between Gender and Global PSQI Score

Sex	Global PSQI score		Total
	Normal	Poor	
Female	49 (49.0%)	51 (51.0%)	100 (50%)
Male	50 (50%)	50 (50%)	100 (50%)
Total	99 (49.5%)	101 (50.5%)	200(100%)

Table 4: Association between Age and Global PSQI Score

Age group	Global PSQI score		Total
	Normal	Poor	
17-19	58 (47.2%)	65 (52.8%)	123(61.5%)
20-22	22 (53.7%)	19 (46.3%)	41(20.5%)
≥ 23	19 (52.8%)	17 (47.2%)	36(18%)
Total	99(49.5%)	101(50.5%)	200(100%)

p Value=0.702

Out of 100 female participants 49 (49.0%) had normal while 51(51.0%) have poor PSQI score whereas 50(50%) males had normal while 50(50%) have poor global PSQI score Table 3.58 (47.2%) subjects had normal PSQI score whereas 65(52.8%) had poor PSQI score falling in age group of 17-19 ,22(53.7%) had normal PSQI score whereas 19 (46.3%) had poor PSQI score falling in age group of 20-22, and 19(52.8%) had normal PSQI score whereas 17 (47.2%) had Poor PSQI score falling in age group of ≥ 23 . There was no significant association between gender, age and global PSQI score after applying chi square test ($p > 0.05$).Table 4.

DISCUSSION

In a study on 244 Iranian medical students, 40.6% reported poor sleep quality; this was significantly associated with lower grades, economic and marital status, and type of training, but not gender¹² which is similar to the current study similarly in a Chinese study, 19% of the medical students were found to have poor sleep quality as assessed by the Pittsburgh Sleep Quality Index (PSQI), with differences seen between years of study but not between genders which is very low compared to present study¹³ but About 70% of Hong Kong medical students self-reported sleep deprivation¹⁴. In a study done in India on the students surveyed, 62.6% were found to be poor sleepers which is similar to our

study². One more study done in India 38% of medical student's reported poor quality of sleep¹⁵. In one more study done by Kaur et al to find association of sleep quality with general health among undergraduate students based on PSQI questionnaire in PGIMER Chandigarh, India showed mean PSQI score of study participants was 4.77 ± 2.518^5 . In a study done by Giri et al in Maharashtra, only 17.3% of the medical students had poor quality of sleep which is very less compared to this study¹⁶. Another study compared sleep patterns between medical and law students in India and found that 60.8% of law students had refreshing sleep at night as opposed to just 47.1% of medical students¹⁷. In a study done by Shad et al. Medical students were found to have more poor sleep (72.9%)².

In a study done by Aruna T et al to find out the sleep pattern among medical students based Chennai, Tamil Nadu showed that more than 70% of university students were having sleep related problems which is higher to the findings from this study¹⁸. In another study in Maharashtra the sleep quality in females is better than the males¹⁶. In a study done by Singh R et al sleep patterns are affected by age, gender, living conditions, doing exercise and workload¹⁵. In a study done in Hong Kong of poor sleep was associated with female gender, relatively higher year of study, and perceived adequate sleep in the past month¹⁴.

Conclusion: The high prevalence rate of poor quality of sleep among medical students shows that further follow-up is needed and also there is need to create awareness among medical students regarding sleep quality.

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Assessment of the reasons of second hand smoking among the school going children.

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ABSTRACT

Introduction-The effects of second hand smoking are adverse on the health of women and men exposed to it. According to the World Bank report, exposure to SHS causes as estimated 5% of the global burden of disease, which is slightly higher than the burden from direct use of tobacco (4%). **Aims and Objectives**- To assess the factors responsible for second hand smoking and frequency of second hand smoking/passive smoking among school going children. **Materials and methodology**- Type of study was prospective study and sample size was 340 out of which 100 qualified the study criteria. Students were taken from higher secondary schools at the catchment area of urban slums. All children in higher secondary division of the selected schools were included in the study. Participation in the study was voluntary. Data were entered and analyzed using Statistical Package for Social Sciences (SPSS). **Results**- A total of 340 students participated in this study. Out of which 100 were exposed to smoking (29.4%). Mean age of participants was 18.46±0.99 years. Among them, 4% said that they were inhaling the smoke from a family member for more than 10 years. In the study, 47% of the students revealed that they used to inhale smoke from a friend's cigarette. **Conclusions**-Late adolescent among higher secondary school students near urban slums in Bhopal district are exposed to second hand smoke in homes, outside and public places. This may be due to lack of awareness among students.

Key-words: Second hand smoking, School going children, Urban slums, Public places, Family member.

INTRODUCTION

The effects of second hand smoking are adverse on the health of women and men exposed to it. ¹ Premature deaths are estimated to be six million due to second hand smoking (globally), which exceeds the combined death tolls of AIDS, tuberculosis, and malaria. It is predicted by researchers that this figure will increase to 8 million by 2030, and developing countries will impart most of these deaths.²

According to the World Bank report, exposure to SHS causes as estimated 5% of the global burden of disease, which is slightly higher than the burden from direct use of tobacco (4%).³ It also implicates 10.9 million loss of disability-adjusted life years which is about 0.7% of worldwide burden of diseases.⁴ The level of exposure to SHS among women and children inside homes and at public places is alarmingly high in the Southeast Asia region.

The association between second-hand smoke and health outcomes, such as frequent respiratory infections, ischemic heart disease, lung cancer, asthma, and stroke, has long been established. Non-smokers who are exposed to second-hand smoke have an increased risk of developing heart disease at least by 25%, stroke by 20%, and lung cancer by 20%.^{5,6,7}

The Government of India has become increasingly engaged with the country's tobacco problem over recent years. ^{8,9} The more comprehensive Cigarette and Other Tobacco Products Act (addressing tobacco use in public places, tobacco advertising, and sale and packaging regulations) was introduced in 2003, and the Framework Convention on Tobacco Control brought into force in 2005.¹⁰ In 2008, Government of India adopted legislations for banning smoking in public places.¹¹ With these interventions, the proportion of children and adolescents exposed to second-hand smoke is expected to come down.

So this study was conducted to assess the causes for second hand smoking and frequency of second hand smoking/passive smoking among school going children.

MATERIAL AND METHODS

A prospective study was conducted. Out of all students interviewed, 340 students from higher secondary schools gave consent to participate in the study. At the catchment area of urban health training centre eight schools were present, out of which only six agreed to participate in the study. Out of 340 students only 100 students qualified the eligibility criteria. Eligibility criteria was that, participants who have smoked ever in their lifetime, were eligible for

this study or those who had done passive smoking in their life time.

A structured questionnaire was prepared based on literature review, and expert opinion. It included socio-demographic characteristics, details of respiratory symptoms, details of active and passive smoking, and indoor air pollution. Section on active and passive smoking was adapted from the Global Youth Tobacco Survey (GYTS) questionnaire.¹²The questionnaire was translated to regional language and back-translated to check for consistency. Data were entered and analyzed using Statistical Package for Social Sciences (SPSS). Descriptive statistics was done using frequencies and percentages. Appropriate statistical tests were applied.

RESULTS

A total of 340 students participated in this study. Out of which 100 were exposed to smoking (29.4%). So, the study was conducted in these 100 cases. Among them, 95% were males.

Among the study participants, 14%reported that they ever smoked a cigarette in their lifetime and 3% reported that they were current smokers. Mean age of participants was 18.46 ± 0.99 years. Participants who were less than 17 years were 5 in number, 27 were in 17 to 18 age group while 68 were more than 18 years. In the study,34% agreed that their family member used to smoke inside the house in their presence. Among them, 4%said that they were inhaling the smoke from a family member for more than 10 years. Majority of the respondents were exposed to smoke exhaled from father and friends. In the study, 47%of the students revealed that they used to inhale smoke from a friend's cigarette. On analysis of factors associated with household exposure to tobacco smoke, low educational status of father was significantly associated with the exposure. There was no statistically significant difference noticed between passive smoking exposure at home and by friends with age, gender, occupation, education of father or maternal education status.

Table 1- Distribution according to passive smoking duration and number of students.

Mean Age	18.46±0.99 years
No. of students exposed to passive smoking at home	53%
No. of students exposed to passive smoking when friends smoke	47%
Duration of exposure to passive smoking at home	
Less than 2 hours	18%
2 to 5 hours	50%
More than 5 hours	32%
Total students participated in the study = 340	
Total students exposed to smoking = 100	

Table 2- Socio demographic profile of participants and their association.

	Passive /Secondhand smoking			
	Friends		Home	
Age group	Number	Percent	Number	Percent
Less than 17 years	2	4.30%	3	5.70%
17 to 18 years	13	27.70%	14	26.40%
More than 18 years	32	68.10%	36	67.90%
P value		0.945		
Gender				
Female	3	6.40%	2	3.80%
Male	44	93.60%	51	96.20%
P value		0.55		
Occupation of father				
Skilled	2	4.30%	0	0.00%
Semiskilled	25	53.20%	31	58.50%
Unnskilled	18	38.30%	18	34.00%
Unemployed	2	4.30%	4	7.50%
P value		0.398		
Education of mother				
Graduate	4	8.50%	6	11.30%
High School	8	17.00%	11	20.80%
Secondary	4	8.50%	9	17.00%
Primary	16	34.00%	18	34.00%
Illiterate	15	31.90%	9	17.00%
P value		0.397		
Education of father				
Graduate	13	27.70%	19	35.80%
High School	4	8.50%	4	7.50%
Secondary	16	34.00%	16	30.20%
Primary	7	14.90%	9	17.00%
Illiterate	7	14.90%	5	9.40%
P value		0.852		

DISCUSSION

Second hand smoking was assessed in schools near to urban slums of Bhopal. In our study this prevalence was 29.4% in schools. The prevalence of adolescents who smoked cigarette in the this research corresponds with evaluated data from GYTS, in which the prevalence of smokers to be around 10% in 13 to 15 years age group in our country.¹²

In our study 29.4% exposed to smoke out of them 53(15.6% out of 340) were exposed in home while 47(13.8% out of 340) were exposed outside with friends. Which corresponds to one of the study done among schoolchildren in Mumbai, I which 16.5% of students were exposed to second-hand smoke at home and 39.9% of students were exposed to second-hand smoke outside their homes.¹⁵WHO Framework Convention on Tobacco Control held at Paris concluded that 100% smoke-free environments are the only way to effectively protect

people's health from the ill effects of second hand tobacco smoke.¹⁶The current study reveals a high proportion of students in age group more than 17 years were exposed to passive smoking at homes, schools, and public places. As per the WHO Report on Tobacco Epidemic 2009, about 34% of children in the age group of 13–15 years were exposed to second-hand smoke at home in the Southeast Asian region.¹³ So, From this study it is evident that in spite of high literacy and better health-care systems, problem of tobacco and its addiction is still prevailing in community. The study was conducted in periphery of urban slums, therefore cannot be generalized to district or state. Limitations can be under reporting or over reporting by the subject as reporting was done by self from the subjects.

CONCLUSION

Students of age group more than 17 years are exposed to second hand smoke in homes, outside and public places. This may be due to lack of awareness among students of this age group. So interventions are required to reduce and control smoking. Also cessation of smoking at public places are required. These interventions and awareness among students will lead to prevention from harmful effects of smoking and make their future productive in right direction away from addiction.

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Self-Medication Practice among the Undergraduate Medical Students of Government Medical College, Uttarakhand

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ABSTRACT

Background: Self-medication is a human behavior in which an individual uses a substance to self-administer treatment for physical or psychological ailments. The most widely used drugs for self-medication are available over the counter for treating common health issues at home or as dietary supplements. It holds a special significance among medical students as they are future doctors. **Objective:** To assess self-medication practice among the undergraduate medical students **Material and Methods:** A cross-sectional study was conducted among the undergraduate medical students of Government Medical College about self-medication practice. All the students present on the day of data collection, who have given written consent and volunteered to participate were included in this study. Data collected was entered into Microsoft Excel 2007 and results were expressed as percentages. **Result:** Out of 431, 91.9% of the students practice self-medication ever in their life out of which, 90.4% practice self-medication in last one year. Majority of the students practice self-medication for fever (89.1%), antipyretics being most commonly used drug. Mild nature of illness (77.8%) was the commonest factor for self-medication and previous prescription (59.6%) was found to be useful source of information. Both convenience and incorrect dosage at 65.9% was recorded as the commonest advantage and disadvantage respectively. 48.7% of the students favour self-medication practice. **Conclusion:** The prevalence of self-medication among the undergraduate medical students is quite high in this study, though less than half of them favour its practice.

Key-words: Self-medication, practice, undergraduate medical students

INTRODUCTION

Self-medication (SM) has been defined as the selection and use of medicines including herbal and traditional products by individuals to treat self-recognised illnesses or symptoms. It is one of the elements of self-care.¹ Recognizing the responsibility of individuals for their own health and awareness that professional care for minor ailments is often unnecessary has made an important place for self-medication in the health care system. Improvements in people's general knowledge, level of education and socioeconomic status in many countries form a reasonable basis for its widespread success.²

In developing countries like that of India, easy availability of a varied kind of drugs together with the problem of inadequate health services result in increased proportions of drugs used as SM compared to prescribed drugs.³ Recently, the Government of India has banned the sale of 328 Fixed Dose Combinations (FDCs) including the one available as over the counter (OTC) without doctor's prescription but whether it will be strictly followed throughout the country is questionable.⁴

Medical students being exposed to the subjects in medicine are more prone for SM which may, at times leads to untoward consequences. They have easy access to information from drug indices, literature, and other

medical students to self-diagnose and self-medicate. In addition, easy access to the medication itself through physician samples provided by pharmaceutical representatives and "The White Coat" guarantees trouble free access to drugs available in pharmacies.⁵

A study conducted at All India Institute of Medical Sciences, New Delhi found that self-medication is high among undergraduate medical and paramedical students in India and it increases with medical knowledge.⁶

As today's undergraduate medical students are responsible doctors of future, this study has made an attempt to assess about the practice of self-medication among them.

MATERIALS AND METHODS

The cross-sectional study was done among the undergraduate medical students of a Government Medical College in Uttarakhand. The study period was of 3 months duration i.e. from August - October, 2017. Every year 100 students are admitted in an academic session starting from the month of August. Therefore, the total number of undergraduate medical students should be about 500 at one particular time. All the students present on the day of data collection were explained the purpose of the study. They were told that their participation was

voluntary. The participants were assured of the confidentiality and anonymity of the information they provide, as the students were asked not to write their names and to elicit correct response from them. The written informed consent was taken. A predesigned, pretested, semi-structured, self-administered questionnaire was used to collect data. After excluding the incomplete proforma and also because of absentees on the day of study being conducted, 431 completed questionnaires were considered for analysis. The data collected was entered into Microsoft Excel 2007 and results were expressed as percentages. Ethical approval was obtained from Institutional Ethics Committee prior to the commencement of study.

RESULTS

Of the 431 students, most 252 (58.5%) of the students were in 20-23 years of age group. The mean age was 20.55 ± 1.6 years. Female students constitute 267 (62.0%). 54 (12.5%) of the student's parents were doctors or related to health care while 200 (46.4%) of the student's close relatives were doctors or related to health care. 396 (91.9%) of the students practice self-medication ever in their life and of these, 249 (62.9%) initiated self-medication ≥ 17 years of age. 358 (90.4%) practice SM in last one year, mostly 254 (70.9%) at a frequency of 1-5 times in a year. [Table 1]

Table 1: Characteristics of the undergraduate medical students

Variables	Frequency	Percentage
Age group (years)		
17- 20	123	28.5
20-23	252	58.5
23-26	56	13
Sex		
Male	164	38
Female	267	62
Any parent doctor or related to health care		
Yes	54	12.5
No	377	87.5
Any close relative doctor or related to health care		
Yes	200	46.4
No	231	53.6
Practice self- medication ever in life		
Yes	396	91.9
No	35	8.1
If yes, age of initiation		
<17	147	37.1
≥ 17	249	62.9
Practice self- medication in last one year		
Yes	358	90.4
No	38	9.6
If yes, no. of times in a year		
≤ 5	254	70.9
>5	104	29.1

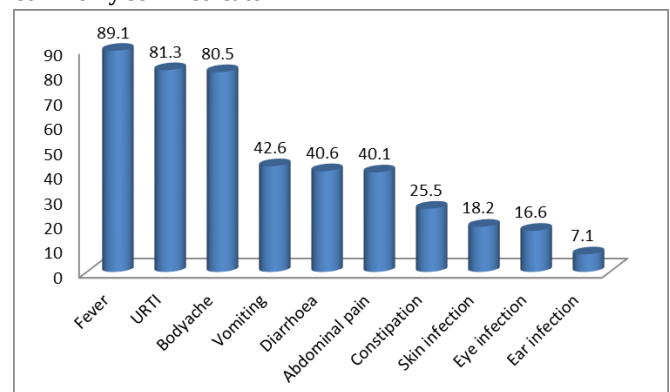
Table 2: Factors contributing to self-medication among the undergraduate medical students

Variables	Frequency	Percentage
*Reasons for self medication		
Mild nature of illness	308	77.8
Previous experience with same illness	236	59.6
Urgency	180	45.4
Previous prescription with same illness	175	44.2
Time saving	164	41.4
Easy availability	164	41.4
Money saving	53	13.4
Privacy	21	5.3
*Source of information for self medication		
Previous prescription	236	59.6
Medical store	210	53
Friends/Seniors	193	48.7
Family members	173	43.7
Medical Books	148	37.4
Internet	111	28
*Advantage of self-medication		
Convenience	284	65.9
Quick relief	238	55.2
Time saving	231	53.6
Economical	74	17.2
*Disadvantage of self-medication		
Incorrect dosage	284	65.9
Wrong diagnosis	254	58.9
Adverse drug reactions	233	54.1
Incorrect duration	222	51.5
Favour self medication		
Yes	210	48.7
No	221	51.3

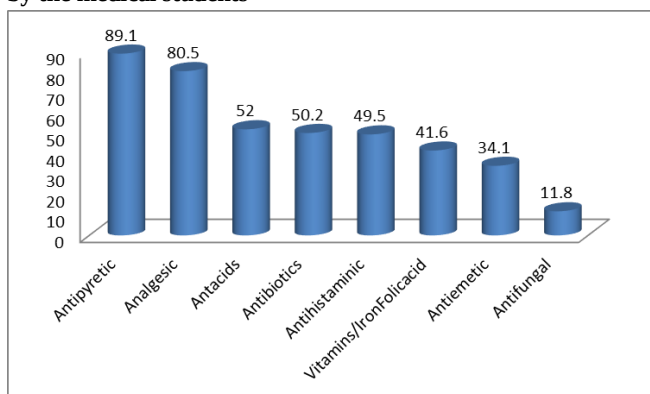
**Multiple responses*

Majority of the students practice self-medication for fever (89.1%), followed by upper respiratory tract infection (URTI), bodyache, etc. [Fig. 1]

Figure 1: Conditions for which the medical students commonly self-medicate



Common group of drugs includes antipyretics (89.1%), analgesics (80.5%), and others. [Fig. 2]

Figure 2: Common group of drugs used for self-medication by the medical students

Mild nature of illness 308 (77.8%) was the commonest reason for self-medication. Others include previous experience with same illness 236 (59.6%), urgency 180 (45.4%), etc. Previous prescription 236 (59.6%), medical store 210 (53.0%) were common source of information for self-medication amongst others. The various advantages of self-medication as reported by the students include convenience 284 (65.9%), quick relief 238 (55.2%), followed by time saving and economical. Disadvantages of self-medication include incorrect dosage 284 (65.9%), wrong diagnosis 254 (58.9%), adverse drug reactions 233 (54.1%) and incorrect duration 222 (51.5%). 210 (48.7%) students favour self-medication. [Table 2]

DISCUSSION

In this study, 91.9% of undergraduate medical students practice self-medication ever in their life out of which 90.4% practice self-medication in last one year. The previously published studies reported prevalence of self-medication among the medical students ranging to the lowest of 40.6% as per Bhatia MK et al ⁷ to the highest of 97.8% as per Al-Hussaini M et al. ⁸

62.9% of the students were ≥ 17 years of age when they initiated self-medication, which means students have started this practice mostly after taking admission in a medical college while Sama S et al ⁹ reported that 68.4% students' age of initiation was < 18 years. In the present study, most of the students practiced self-medication at a frequency of 1-5 times per year while Patil SB et al ¹⁰ observed that mostly student practice self-medication 2-3 times per year.

Fever was the most common symptom for which self-medication was practiced. Similar observation was made by other researchers in their study. ¹¹⁻¹⁵ While in Patil SB et al, ¹⁰ Zardosht M et al, ¹⁶ and Shehnaz et al ¹⁷ URTI was the most common symptom and in Al-Hussaini M et al, ⁸ headache and Haroun MF et al, ¹⁸ bodyache was the commonest symptom for which self-medication was practiced.

In this study, mild nature of illness (77.8%) was the most common factor for self-medication. Similar observations were made in all the other studies except in Sunitha M et al ¹⁹ where previous experience with same illness and Nirmal TP et al ²⁰ convenience was the most common reason for self-medication.

In the present study, the most common source of information for self-medication was previous prescription with same illness. Similar findings were also observed by other researchers. ^{6, 14, 18, 21} In some studies ^{12, 15, 16} authors reported pharmacists as the most common source of information. Pal J et al ¹³ reported internet, Kumar N et al ¹⁴ books, Nirmal TP et al ²⁰ friends and Joshi DK et al ²² family as the commonest source of information for self-medication.

In this study, according to the students most common advantage of self-medication was convenience, while in Kasulkar AA et al ¹⁵ it was quick relief.

In this study, the most common disadvantage of self-medication was incorrect dosage, while in Pal J et al ¹³ it was wrong diagnosis.

In the present study, 48.7% students favour self-medication. Similar observation was made by Dilie A et al ²³ while in different other researches self-medication was favoured ranging from 66% as per Sunitha M et al ¹⁹ to 70.5% as per Pal J et al. ¹³

LIMITATION

The questionnaire was self-administered to the student, so there may be falsification of statements made by them despite of being ensuring about their confidentiality of participation. Although the students were requested to complete the questionnaire independently, discussion between them could not be entirely ruled out. The study was done in only one medical college of the state, it could have been extended to other medical colleges and also could have been done in the community among non-medical personnel.

CONCLUSION: The prevalence of self-medication among the medical students is quite high though less than half of the students favour its practice. Responsible self-medication as suggested by World Health Organization for every individual should also be introduced in medical curriculum.

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Study of prevalence of anemia among women of suburbs of Hyderabad, India and its correlation with hematological parameters

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ABSTRACT

Background: Anemia is a major public health problem in India with major consequences for human health as well as social and economic development. Iron deficiency anemia continues to be an overwhelmingly major cause of anemia. Women with even mild anemia may experience fatigue and have reduced work capacity. In our cross sectional study, we tried to assess the prevalence of anemia in semi-urban women in selected outskirts of Hyderabad. **Methods:** This cross sectional study has been initiated using consecutive sampling methodology on the specified days of study implementation based on the selection and exclusion criteria in the Guru Nanak Care Hospital laboratory. Samples were collected from 501 individuals who were eligible for the study from urban slums of Quthbullapur, Ranga Reddy district. Any female visiting the lab for hematological parameters testing falling between 11-40 years of age were included till the sample size was achieved. Data analysis was done using Microsoft Excel and SPSS 20.0. **Results:** The study sample of 501 cases had only 50% population with normal Hb%. The remaining half of the population had mild anemia in 20% of cases, moderate anemia in 25% and severe anemia in 5% of cases. Severe Anemia was more prevalent among 31-40 age group (7.2%; 9/125) followed by among 21-30 age groups (6.1%; 14/231). Moderate anemia was highest among 11-20 age groups with 32.7% of total sample with 11-20 age groups (33/101). **Conclusions:** Prevalence of moderate and severe anemia is more than 25% among the child bearing age group women and hence need to be focused in public health programs planned as part of Anemia prevention activities.

Key-words: women, anemia, hematological parameters

INTRODUCTION

According to WHO anemia is defined as condition in which the hemoglobin concentration in the blood is below for that particular Age and sex¹. Anemia is a global public health problem with major consequences for human health as well as social and economic development¹. Anemia is a major public health problem in India. The high-risk groups for anemia are pregnant and lactating females and children²⁻³. Prevalence in this subgroup has been found to vary from 50-90% in different parts of India³. According to NFHS (National Family health survey – 2005/2006) the prevalence of anemia among reproductive age group women 15- 49 is 55% and 70%, in children aged 6 – 59 months⁴. Anemia is considered as an indicator of both poor nutrition and poor health and linked with major development goals⁵.

In developing countries most common cause of anemia is nutritional. Iron deficiency anemia continues to be an overwhelmingly major cause of anemia and is a major global health challenge. There are many classifications of anemia. Morphological characteristics provide etiological clues. In order to characterize the type of anemia the workup should include hematological parameter like the Hb%, PCV, RBC indices and peripheral smear study. The potential impact of anemia in women of child bearing age include increased risk of low birth weight or prematurity,

perinatal and neonatal mortality, inadequate iron stores for the newborn, increased risk of maternal morbidity and mortality, and lowered physical activity, mental concentration, and productivity⁶⁻⁸. Women with even mild anemia may experience fatigue and have reduced work capacity⁶. NNACP- National Nutritional Anemia Control Program aims to control anemia in India. The program, implemented through the Primary Health Centers and its subcenters, aims at decreasing the prevalence and incidence of anemia in women of reproductive age. It focuses on three vital strategies: promotion of regular consumption of foods rich in iron, provisions of iron and folate supplements in the form of tablets to the high risk groups, and identification and treatment of severely anemic cases.⁹ In 1991, NNAPP was renamed as NNACP with new strategies to control nutritional anemia. Studies on Anemia in India are highly focused on either rural women or urban women¹⁰⁻¹¹. Suburban inhabitants are generally considered better than the rural women; however, the demographic challenges such as higher cost of living, higher expenditure towards health, education and other basic needs of life make them more vulnerable to poor nutrition compared to rural women.

MATERIALS AND METHODS:

Study was done by Guru nanak CARE hospital in co-ordination with an NGO organization to assess the severity, prevalence of anemia in an urban slum in Quthbullapur, Ranga Reddy district.

Setting: Samples were collected in the community halls of the suburbs. The samples were collected in EDTA vacutainers and transported by maintaining cold chain. The samples were processed in Department of Laboratory Medicine at Guru Nanak CARE Hospital. This cross sectional study has been initiated using consecutive sampling methodology on the specified days of study implementation based on the selection and exclusion criteria in the hospital laboratory. Samples were collected from 501 individuals who were eligible for the study. Samples were collected from females only. Above 11 years of age was included as a criteria. Males were not included in the study. Geriatric population was excluded. The hematological testing was done in Department of Laboratory medicine, Gurunanak care hospital. The equipment used included XN-350 5 Part hematology analyzer. The evaluated parameters included Hb (Hemoglobin) concentration, RBC (Red Blood Cells) indices- MCV (Mean Corpuscular Volume), MCH (Mean Corpuscular Hemoglobin), MCHC (Mean Corpuscular Hemoglobin Concentration), PCV, RBC, TLC (Total Leukocyte Count), Platelet count. Slides were prepared for peripheral smear examination.

Following was the criteria used to define Anemia by age group which is based on hemoglobin concentration according to world health organization.

Table 1: Definition of Anemia by age group of study participants

AGE	MILD	MODERATE	SEVERE
11 – 14 YEARS	11 – 11.9 gms/dl	8 – 10.9 gms/dl	< 8 gms/dl
>14 YEARS (FEMALE)	11 – 11.9 gms/dl	8 – 10.9 gms/dl	< 8 gms/dl
> 14 YEARS (MALE)	11 – 12.9 gms/dl	8 – 10.9 gms/dl	< 8 gms/dl

Data analysis: The data entry and analysis was done using Microsoft word, Microsoft Excel & and SPSS 20.0.

RESULTS

The study sample of 501 cases had only 50% population with normal Hb%. The remaining half of the population had mild anemia in 20% of cases, moderate anemia in 25% and severe anemia in 5% of cases (**Figure 1**). Statistical analysis was done using percentages for identifying the prevalence of anemia, distribution of anemia cases across various age groups, grading of anemia and observations in peripheral smear.

Severe Anemia was more prevalent among 31-40 age group (7.2%; 9/125) followed by among 21-30 age groups (6.1%; 14/231). Moderate anemia was highest among 11-20 age groups with 32.7% of total sample with 11-20 age groups (33/101) (**Figure 2; Table 2**). When analyzed

within category of Anemia, 21-30 age group contributed to 58.3% (14/24) for cases with severe anemia followed by 31-40 age group with 37.5% (9/24) (**Table 3**). On the whole, the age group of >40 years has highest number of Normal Hb% cases (63.6%). The age groups of 21-30 and 31-40 are have more cases of all categories of Anemia in the study population (**Table 2**).

Figure 1: Distribution of Hb% status in the study sample

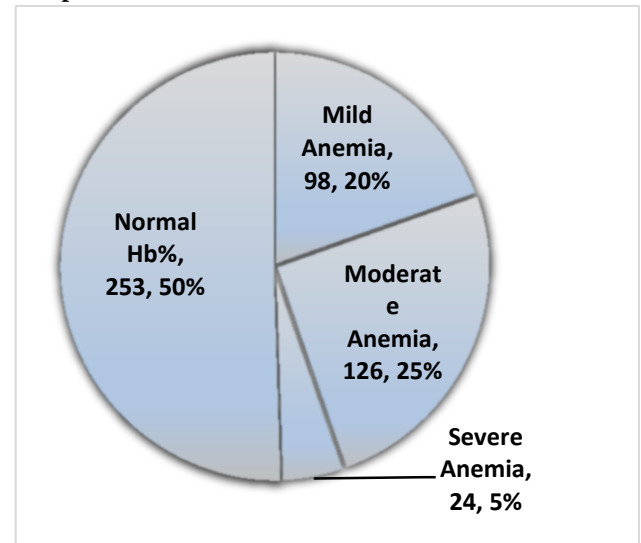
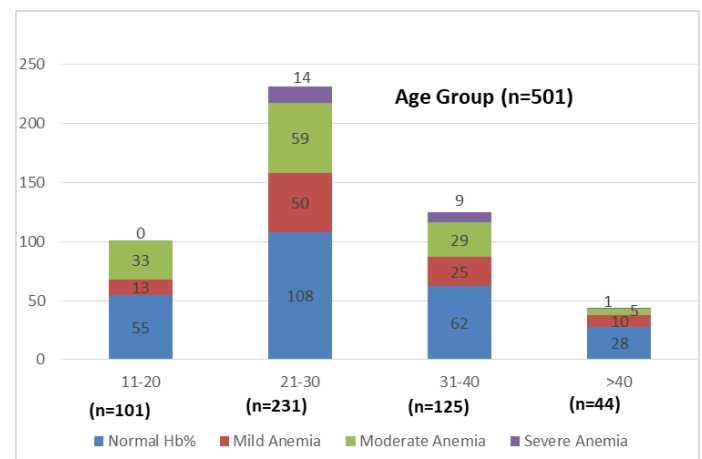


Table 2: Anemia category wise distribution of patients

Age Group	Normal Hb% n (%)	Mild Anemia n (%)	Moderate Anemia n (%)	Severe Anemia n (%)	Total n (%)
11-20	55 (54.5%)	13 (12.9%)	33 (32.7%)	0 (0.0%)	101 (100%)
21-30	108 (46.8%)	50 (21.6%)	59 (25.5%)	14 (6.1%)	231 (100%)
31-40	62 (49.6%)	25 (20.0%)	29 (23.2%)	9 (7.2%)	125 (100%)
>40	28 (63.6%)	10 (22.7%)	5 (11.4%)	1 (2.3%)	44 (100%)
Total	253 (50.5%)	98 (19.6%)	126 (25.1%)	24 (4.8%)	501 (100%)

Figure 2: Age group wise distribution of Anemia



There were two cases of macrocytic anemia identified in the study population. However, around 30% of the study population had microcytic/ hypochromic anemia (**Table 5**).

Table 3: Anemia category wise distribution of patients

Age-group	Normal Hb% n (Col %)	Mild Anemia n (Col %)	Moderate Anemia n (Col %)	Severe Anemia n (Col %)	Total n (Col %)
11-20	55 (21.7%)	13 (13.3%)	33 (26.2%)	0 (0.0%)	101 (20.2%)
21-30	108 (42.7%)	50 (51.0%)	59 (46.8%)	14 (58.3%)	231 (46.1%)
31-40	62 (24.5%)	25 (25.5%)	29 (23.0%)	9 (37.5%)	125 (25.0%)
>40	28 (11.1%)	10 (10.2%)	5 (4.0%)	1 (4.2%)	44 (8.8%)
Total	253 (100%)	98 (100%)	126 (100%)	24 (100%)	501 (100%)

Table 4: Categorization of Mean Corpuscular Volume of RBCs

Age-group	Low MCVn (%)	Normal MCVn (%)	Total
11-20	29 (28.7%)	72 (71.3%)	101
21-30	61 (26.4%)	170 (73.6%)	231
31-40	34 (27.2%)	91 (72.8%)	125
>40	7 (15.9%)	37 (84.1%)	44
Total	131 (26.1%)	370 (73.9%)	501

Table 5: Peripheral smear examination for anemia

Age-group	Macrocytic	Microcytic/Hypochromic	Normocytic/Normochromic	Total
11-20	1	34	66	101
21-30	1	76	154	231
31-40	0	39	86	125
>40	0	9	35	44
Total	2	158	341	501

Discussion:

It is evident from the current study that the burden of nutritional anemia is high among adolescent girls and women of reproductive age. We observed that moderate anemia was prevalent nearly among 25% of population while the severe anemia was more observed among 21-40 years age group women which is primarily of child bearing age. Various studies on prevalence of anemia from India show values ranging from 41 – 66%. However; the Mean Corpuscular Volume (MCV) was not much different across various age groups. There were also 2 cases of macrocytic anemia observed.

Our findings of RBC indices and peripheral smear examination conclude that Microcytic/hypochromic the most common cause of which is Iron deficiency in the study subset. Dietary counseling done by the

nutritionist from Care hospital revealed poor food intake, low socio economic status and lack of dietary knowledge which could not be backed up with structured data collection.

Iron deficiency anemia impair the concentration among adolescent girls, reduces their academic achievement, physical strength and increase risk of infection and women of child bearing age has important public health implications. Iron deficiency is a treatable cause of anemia. Reasons why urban poor women may be at higher risk of anemia than rural poor women is their lack of access to their own income or resources because of lower rates of extra-household employment and reduced economic power within the household¹²⁻¹⁵. The urban poor may also experience higher rates of infection related to poor sanitation or high rates of reproductive tract infections, gynecological morbidity, or sexually transmitted diseases¹⁶⁻¹⁷. Although urban areas theoretically have greater access to a wide variety of food and nutrients through close access to markets, extreme poverty limits the ability of the urban poor to purchase them.

The results of this study can be used by public health programs to design target interventions aimed at reducing the huge burden of anemia in India. The high prevalence of mild and moderate anemia demands due emphasis on iron and folic acid supplementation and health education.

Conclusions:

Prevalence of moderate to severe anemia is more than 25% among the child bearing age group women and hence must be considered in planning of suitable public health programs for better society and healthy future generations.

Limitations:

We did not have comparative groups of rural or urban women in the study population which would have given better analysis across age groups. The occupational, economic and nutritional status of the study population was also not available for detailed analysis. Comparison across men of similar age groups in the same geographic location would have made the status of anemia clear in the population across gender.

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Cross-sectional study on the modern contraceptive usage among married women of reproductive age in a village of South Tamilnadu

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ABSTRACT

Introduction: Proper utilization of contraceptives can bring down the mortality & morbidity among mothers and their children and also bring about social & psychological development of the family as a whole. Contraceptive use in Tamilnadu has unexpectedly come down. Interventions that had worked previously might no longer be working. **Objectives:** To determine the use of modern contraceptives among married women & to study the associated factors. **Methodology:** A cross-sectional study was carried out from February to March 2018 in the village of Marapadi, situated in the southernmost district in Tamilnadu. A hundred randomly selected married women were included and a structured questionnaire was used to collect data. **Results:** The current contraceptive usage was 67%, out of which 54% was temporary & 13% was permanent. Condoms (31) & OCPs (18) were the most commonly used temporary contraceptive. However, none of the women reported male sterilisation. Media was the most common primary source of information (64%). More than half of the women who have not undergone sterilisation expressed willingness to do so in the future. Majority of women (92%) were involved in deciding contraceptive use. Higher occupation was significantly associated with better contraceptive use. No other factor including number of children and sex preference of next child influenced the use of contraceptive. **Conclusion:** The prevalence of contraceptive though higher than most studies was still not satisfactory. Temporary method was the most common type used. Women in our study were comparatively better empowered. The positive attitude towards sterilisation needs to be converted to better utilisation of the same. Health professionals have to be the primary source of information when it comes to contraception.

Key-words: Contraceptive, Sterilization, Condom, Eligible couple

INTRODUCTION

The world population started growing at an alarming rate from around 1920 when the growth rate was 0.6%, to reach a peak of 2.1% by 1962. However, since that time it has been in decline.¹ The world's population was estimated to be around 7.6 billion by mid-2017 and it is growing at a rate of 1.10% per year.² Consequently, it is expected to increase continuously in the coming decades to reach 8.3 billion in 2030 and 8.9 billion in 2050. In the event of fertility reaching the replacement level instantly, the population would stabilize at around 9 billion in the second half of the 21st century.³ Though the growth rate is coming down, the boost in population in the second half of the 20th century has led to overpopulation in the majority of the under-developed & developing regions of the world. This, in turn, has led to resource scarcity, unemployment and the inability to fulfil the basic needs of the people including health.

India's population was estimated to be 133.9 crores in 2017 and by 2030 India is expected to become the most populous country in the world by overtaking China. It

is expected to reach 165.9 crores by 2050.² If current efforts in population control are sustained, India is expected to move below the replacement level of fertility (2.1 births per woman) between 2025 and 2030.⁴ India was one of the first countries to launch a population control programme. According to NFHS-4 the fertility level in India was 2.2 children per women.⁵ Thus the programme has borne fruit over the decades, though our country is yet to reach the goal, i.e. replacement levels of fertility. Therefore, we Indians cannot relax in our achievement so far, but need to push forward. In fact, the massive current population in India that needs access to limited resources suggests that the country needs to reach replacement levels as soon as possible and persevere on, to may be achieve a one-child norm.

Proper family planning can be linked to the health of the mother & her children and hence it forms an integral part of any maternal & child health program. Proper utilization of contraceptives can bring down the mortality & morbidity among mothers and their

children, reduce unsafe abortions, reduce adolescent pregnancies and help to prevent sexually transmitted diseases including HIV/AIDS. It also empowers the parents in reducing their family size, thus bring about improved nutrition, social & psychological development of the family as a whole.⁶

Contraceptive methods are the preventive methods to help women avoid unwanted pregnancies. WHO defined family planning, as a way of thinking and living that is adopted voluntarily, upon the basis of knowledge, attitudes and responsible decisions by individuals and couples, in order to promote the health and welfare of the family group and thus contribute effectively to the social development of the country. They include all spacing methods (temporary) and terminal methods (permanent) to prevent pregnancy. Nine out of ten contraceptive users are using modern method contraceptives. Modern contraceptive methods include male and female sterilization, injectables, intrauterine devices (IUDs/PPIUDs), contraceptive pills, implants, female and male condoms, diaphragm, foam/jelly, the standard days method, the lactational amenorrhoea method, and emergency contraception.⁵

According to a 2015 report by WHO, 64 percent of married or in-union women of reproductive age worldwide were using any form of contraception, with modern methods contributing 90% of the total use. Female sterilization and the IUD are the two most common methods used worldwide. Looking at the scenario in India, the prevalence of modern contraceptive usage among married women was 52.4%, which accounts for 87.6% of all contraceptive use. Moreover, among the modern methods used, sterilization is the primary method used followed by condoms and Oral contraceptive pills.⁷ The family welfare programme in India is now geared towards providing a variety of contraceptive options in what is known as the Cafeteria Approach. The latest of this is the introduction of Antara (Injectable contraceptive) & (weekly oral contraceptive pill) in 10 states including Tamilnadu in September 2017.⁸

NFHS-4 reported an unexpected decline in the contraceptive usage rates in the state of Tamilnadu, which witnessed a decline from 61 % in NFHS-3 to 53%. This decline was reflected in the modern method of usage also, which fell from 60% to 53 percent.⁹ Experts feel that this might be due to increased use of emergency fill & abortions, both of which have severe complications/ side effects.¹⁰ This might be a momentary setback in the program which will recover in the coming years. Conversely, if this is the start of a new trend, it means that the factors that were influencing family planning in the past few decades may not relevant any longer or some new factors are in play. Given the role played by social & cultural factors

in acceptance of family planning & keeping in view the changing social & cultural landscape of the state, this might not be farfetched. Hence the study was conducted to study the use of modern contraceptives among married women of a village in Kanyakumari district, South India.

AIMS & OBJECTIVES:

- (i) to determine the use of modern contraceptives among married women of a village
- (ii) to study the factors influencing the contraceptive usage among these women

MATERIAL & METHODS

A cross-sectional study was carried out from February to March 2018 in the village of Marapadi. This village is situated in the Arumanai Panchayat of Kanyakumari district in south Tamilnadu and has a population of 1083 including 161 eligible couples. Institutional Ethical Committee approval was obtained before the start of the study. Women who are part of the eligible couples in Marapadi village and who were living with their husbands were included in the study. Those not willing to participate & those who were not accessible for data collection were excluded. A current contraceptive use was defined as the use of any one of the modern contraceptive methods in the past one month by the woman or her partner. The sample size was calculated to be 96, using the formula $Z\alpha^2pq/d^2$, where p was the prevalence of contraceptive use, according to a previous study, i.e. 47.1%.¹¹ The value of q was 100 – p i.e. 52.9 & d was a relative precision of 20%. This was rounded up to 100 & so a final sample of 100 women was taken for the study. The sampling frame was constructed on the basis of information available in the eligible couple register. Out of the 161 eligible couples registered, 7 couples were either residing outside or had a spouse working outside on a long-term basis. Thus the sampling frame contained 154 women. From this, a total of 100 married women was selected by simple random sampling using a lottery method. The selected women were contacted, the details of the study explained to them & informed written consent obtained. Data was collected using a pre-tested structured questionnaire. To help the women freely express their views, two female interviewers conducted all the interviews and care was taken, that no other person, including family members was present nearby at the time of data collection, to ensure privacy. The questionnaire included questions on sociodemographic characteristics, contraceptive usage, decision making related to contraceptive and factors influencing it. Collected data was entered in iWork Numbers® version 5.0 and analysis of the data was done using

GNU PSPP version 1.0.1. Chi-square test and Fisher's exact test were used to test the association & a P value of < 0.05 was considered statistically significant.

RESULTS

Table 1: Socio-demographic characters of the study population

Characteristics	Frequency (n = 100)
Age	
18 years - 25 years	77
26 years - 30 years	18
31 years - 35 years	4
More than 36 years	1
Religion	
Hinduism	50
Christianity	40
Islam	10
Educational status	
Professional	8
Graduate/ UG	31
Higher secondary	27
High school	12
Middle school	11
Literate/ less than middle school	11
Occupation	
Unskilled	15
Skilled	28
Semi professional	31
Professional	8
Unemployed	18
Socioeconomic Classification	
Class I	8
Class II	21
Class III	38
Class IV	26
Class V	7
Number of years of marriage life	
0-5 years	64
6-15 years	32
> 15 years	4
Total number of Living children	
No child	29
1or 2 children	60
3 or more children	11

A total of 100 married women from the village of Marapadi participated in the study. Most of the women belonged to the age group of 18 -25 yrs (77%) and as far as religion is concerned, Hindus were the most common (50%) followed by Christians (40%). Socioeconomic classification based on modified B.G

Prasad's classification revealed that class III was the most common (38%) group. All 100 women who participated in the study were literates, of which 39% had a college education. The majority of participants, i.e. 82% were employed, of which a significant portion (37.8%) were semi-professionals. Two third of the participants (64%) were married within the past 5 years and 29% are yet to have children. (Table 1)

Table 2: Primary source of information

Source	Frequency
Health care professionals	8
Friends and family	28
Media	64
Total	100

Figure 1: Pie chart showing the contraceptive use among the women

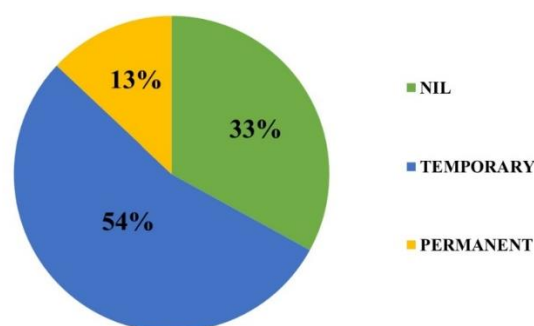


Figure 2: Pie chart showing the type of contraceptive method used

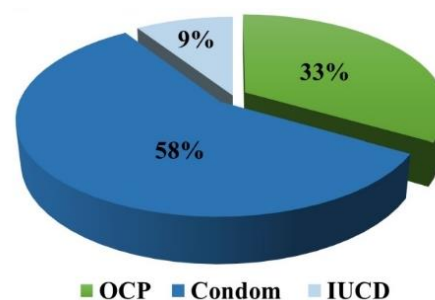
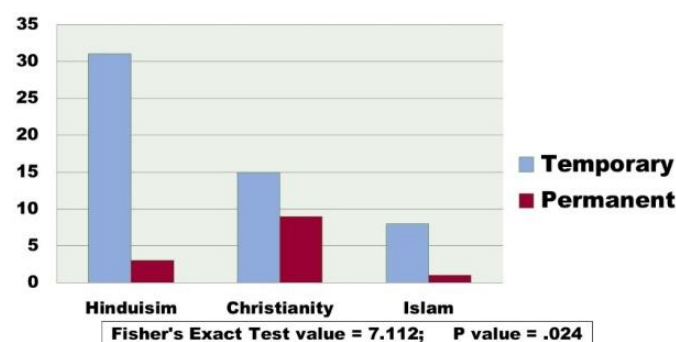


Figure 3: Clustered column showing the relationship between religion and type of contraceptive used



Majority of the participants (78%) did not have a male child & 35% did not have a female child. Moreover,

three-fourths of the study participants, i.e. 74 women wanted more children in the future, out of which, 45 women (60.8%) wanted their next child to be a male while 29 (39.2%) wanted it to be a female. Conversely, 23 women (31.1%) preferred not to have a male child while 15 women (20.3%) did not wish to have a female child in the future.

Only 67 out of 100 women (95% CI: 56.9, 76.1) among the study population were using some form of modern contraceptive at the time of data collection. Temporary contraceptive was the most common type of contraceptive methods currently in use among the study population. (Figure 1)

Moreover, among the 54 women using temporary contraceptive only three types were in current use i.e. Condoms, Intrauterine devices (IUD) & Oral contraceptive pills (OCP), of which condoms (58%) were the most commonly used. (Figure: 2) None of the women had a husband who had undergone vasectomy.

Media was the most common source of information about contraceptives (64%). However, only eight women reported receiving information about contraceptive primarily from Health professionals (Table 2). Only two third of the participants (72%) felt that contraception is necessary for them. A little more than half of the women (55.2%) who have not yet undergo sterilization expressed a willingness to undergo the procedure in the future. Majority of the study participants (92%) discussed the use of contraception with their husbands. However, seven women reported that they are not usually included in the process of deciding contraceptive usage.

The occupation of the women had a significant impact (p -value = 0.039) on the current use of any contraceptive methods, with unskilled workers using contraception the least (33%). The current use of any contraceptive methods was not associated with age, religion, socioeconomic status or education. Moreover, the number of living children, sex preference of next child & desire to have more children also did not have a significant influence on the current use of contraceptive. Current contraceptive usage was more among women married within the past 5 years, however, the association between duration of marriage & contraceptive use was not statistically significant (p -value = 0.343).

Among those who were using contraception, religion had a significant influence on the type of contraception used, with a higher proportion of Christians preferring permanent methods (Figure 3). The type of contraception methods used was not associated with age, socioeconomic status, education, occupation,

years of marriage, sex preference or number of living children.

DISCUSSION

According to the findings in our study, 67 percent of the study population were using some form of modern contraceptive. Compared to the NFHS-4 findings, the prevalence was much higher than the state level of 53% and the district prevalence of 43.8%.⁹ A study done in a nearby tertiary care hospital by Nair et al showed that 47.1% were using some form of modern contraceptive.¹¹ Another study among women in a rural area of Coimbatore by Patel revealed that 52.6% of them were using some form of modern contraceptive.¹² Makade et al reported a similar prevalence of 68.42% among women in a slum in Mumbai.¹³ A study done by Agarwal et al in Bihar reported an even lower prevalence of 42 percent.¹⁴ Thus women in our study area were comparatively better in the use of contraceptive.

The temporary contraception was the most common type of contraceptive method currently in use among our study population. Thulaseedharan conducted a study in the neighbouring district of Trivandrum in Kerala and found that the temporary methods was the most commonly used type & 13.3% had undergone sterilization.¹⁵ A similar finding was reported from Chandigarh by Chopra & Dhaliwal where permanent methods were not much favoured by the participants in this study i.e. only 5.9%. However, vasectomy formed one-fourth of the permanent methods, while our study did not report any vasectomy.¹⁶ Makade et al also reported a similar finding of a low prevalence of sterilization (12%) compared to temporary methods (56.4%).¹³ Kruthika & Metgud reported a prevalence of 16% in Belgaum in the neighbouring state of Karnataka.¹⁷ Contrary findings were seen by Agarwal et al who reported that permanent contraceptive as the most commonly used (74.6%).¹⁴ Most users among women in slums of Raipur were using permanent methods (92.8%) according to the study by Bandhi et al.¹⁸ The higher use of temporary method seen in our study may be due to the higher proportion of recently married women & also due to the fact that three-fourth of them want more kids. The influence of media, which was the major source of information also needs to be considered, as most advertisements are focused on temporary methods particularly condoms.

The study found that among temporary contraceptives, condom was the most commonly used followed by OCP & IUD. Similar findings were reported by Nair et al & Patel in two different area of Tamilnadu.^{11,12} Agarwal et al reported that OCP was the most commonly used temporary method followed by condoms.¹⁴ Makade et al & Bandhi et al also reported a

similar finding in their study done among women in slums of Raipur & Mumbai respectively.^{13,18} A study among the urban population in Chandigarh by Chopra & Dhaliwal found that condoms were the most common temporary contraceptive followed by IUD & OCP.¹⁶ However, in an urban slum of Delhi, IUD was the most commonly used temporary method according to a study by Aeri & Passi.¹⁹

Media was the most common source of Information about contraceptives (64%) with friends & family coming in second (28%). Bandhi et al found that Health professionals as a whole were the most common source of health education followed by media.¹⁸ Chopra & Dhaliwal also reported a similar finding among women in Chandigarh.¹⁶ Nair et al study revealed that health professionals were the most common source of information followed by media.¹¹ Thus there was a significant lack in the contribution by the health professionals in our study area.

Only two third of the participants (72%) felt that contraception is necessary for them. A little more than half of the women (55.2%) who have not yet undergo sterilization expressed a willingness to undergo the procedure in the future. Thus there was significant willingness towards utilizing permanent methods in the future among our study population. However, this will need to translate into action in the future.

Majority of them (92%) discussed the use of contraception with their husbands. Seven out of hundred women were not usually included in the process of deciding contraceptive usage. A study done by Char et al exploring the influence of family members in the decision to use contraceptives among families in rural Maharashtra showed that 18.3% of wives were excluded from the decision-making altogether.²⁰ A study by Makade et al among women of a slum in Mumbai revealed that 32.4 percent were not involved in deciding which contraceptive to use.¹³ Another study done in West Bengal by Mundle et al showed that 40% of women were not involved in the decision-making process.²¹ This shows that women in our study area are better empowered.

The occupation had a significant impact on the use of contraceptives, with unskilled workers using contraception the least. The current use of any contraceptive methods was not associated with age, religion, socioeconomic status and education. Current contraceptive usage was more among women married within the past 5 years; however, the difference was not statistically significant. Bandhi et al also found a significant association between occupation and contraceptive usage. In addition, the age of women also influenced contraceptive usage. Conversely, as the education increased the contraceptive usage

decreased, which was found to be statistically significant. Similar to our study, Bandhi et al also reported that there was no influence of socioeconomic status on the contraceptive use.¹⁸ Nair et al study showed that contraception usage was influenced by parity & number of male children.¹¹ Patel reported that the use of contraception was significantly associated with age of the women, while parity, education and social class had no influence on the contraceptive usage.¹² Thus we see that the factors influencing the use of contraceptive vary from one community to another. However most studies agree that socioeconomic status is not a influencing factor. This shows that socioeconomic status does not determine access to some form of contraceptive methods.

Among those who were using contraception, religion had a significant influence on the type of contraception used with a higher proportion of Christians preferring permanent methods. This difference could not be explained by the distribution of age group, number of children, etc. among the various religious groups as they did not vary significantly. The type of contraception methods was not associated with age, socioeconomic status, education, occupation, sex preference & number of living children. Thulaseedaran reported a significantly lower prevalence of female sterilization among women with higher levels of education in Trivandrum.¹⁵

CONCLUSION:

The prevalence of modern contraceptive use was comparatively better among the women studied but is still not satisfactory. Temporary contraception was used by a majority of these women. Compared to other communities in the country, the women in our study area have a significant role in deciding on contraceptive utilization, suggesting better empowerment. Factors that are usually considered to determine usage were not found to have significant association with it. The role of health professionals in providing information about contraception was also poor with media taking center stage. Women with a positive attitude towards sterilization need to be motivated to convert thought into action. Moreover, sterilization should be made a social norm for couple who have completed their family. The health professionals are best suited to provide multiple choices instead of championing a single method.

Hence, they need to be the primary source of information so that the cafeteria approach can be successfully implemented. The study brought out details from the eligible couples of a single village and had higher proportion of younger age group & recently married couples. Further studies are needed to bring

out the influence of various factors, even those not conventionally thought of.

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