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Original Research Article

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Original Research Article

Association of haemoglobin level during pregnancy and iron supplementation on postpartum anaemia: a community based cross sectional study

Darshan Bhagwan[1], Ashwini Kumar[2], Chythra Raghavendra Rao[2], Asha Kamath[2]

Date of Submission: 13.04.2016 **Date of Acceptance: 18.04.2016**

Abstract

Introduction: Anaemia affects more than 50% of women in reproductive age group. India is one of the countries with high prevalence of anaemia and is one of the main contributors for maternal deaths , According to NFHS 3 data iron deficiency is seen in all the age group especially in reproductive age group. More than 70% of women are found to be anaemic in a study conducted in northern India. Around 30% of mothers became anaemic during postpartum period who were having normal haemoglobin levels during pregnancy. **Methods:** The present community based cross sectional study was conducted in rural field practice area of Kasturba medical College. Study population included postnatal mothers visiting our rural clinic. Details regarding iron and folic acid consumption were obtained from Proforma which was formulated after extensive review of literature and haemoglobin estimation was done by using indirect cyanomethaemoglobin method. The collected data was entered and analyzed using SPSS version17.0.Results were expressed in the form of percentages and proportions. **Results:** Significant association was found between anaemia during postnatal period with hemoglobin level during pregnancy.(OR=2.64,95% CI = 1.14-8.08). No significant association was observed between type of iron supplementation, gestational age of starting iron supplementation and number of tablets consumed during pregnancy with anaemia during postnatal period. **Conclusion:** Higher prevalence of anaemia was noted in mothers having lower hemoglobin level during antenatal period and was found to be statistically significant. Community based educational programmes should be initiated to increase awareness among mothers regarding consumption of IFA tablets on a regular basis and to dispel the myths and misconceptions related to its consumption.

Keywords: Iron and Folic Acid, postnatal, anaemia

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Introduction

Anaemia affects more than 50% of women in reproductive age group and maximum number of victims are from south east Asian region and African region. World Health Organization (WHO) aims to reduce the anemia in reproductive age group to 50% by the year 2025.Stratergies to control anaemia includes fortification of food by iron supplements, provision of iron containing supplements and control of infections including malaria. WHO recommends intermittent use of iron and folic acid tablets in menstruating women and daily supplementation of IFA in antenatal women. (1)

According to WHO, wherever prevalence of anaemia is less than 40% 60mg of iron and 400 microgram of Folic acid must be provided during pregnancy and wherever the prevalence is more than 40% 60mg of iron and 400 microgram of folic acid must be provided during pregnancy.(2)

India is one of the countries with high prevalence of anaemia and is one of the main contributors for maternal deaths. According to NFHS 3 (National Family Health Survey) data iron deficiency is seen in all the age group especially in reproductive age group. According to Government of India Guidelines all pregnant women must consume IFA tablets for 100 days during pregnancy as well as postpartum period.Nutritional education is also provided during Village Health and Nutrition days. (3)More than 70% of women are found to be anaemic in a study conducted in northern India. Around 30% of mothers became anaemic during postpartum period who were having normal haemoglobin levels during pregnancy.(4)

The objective of present study was to assess the effect of haemoglobin status during pregnancy and consumption of IFA tablets on postpartum anaemia.

Methodology

The present community based cross sectional study was conducted in rural field practice area of Kasturba medical College.Study population included postnatal mothers visiting our rural clinic. Sample size was calculated based on the assumption that 50% of pregnant women are anaemic with a relative precision of 10% and 95% confidence Interval. Details regarding iron and folic acid consumption was obtained from Proforma which was formulated after extensive review of literature and haemoglobin estimation was done by using indirect cyanomethaemoglobin method.Ethical committee approval was obtained from Institutional Ethics Committee of Kasturba Medical College Mangalore. Informed consent was obtained from the participants after explaining in detail regarding the purpose and procedure of the study.The collected data was entered and analysed using SPSS version17.0.Results were expressed in the form of percentages and proportions.

Result

Table 1. shows cross tabulation between haemoglobin level during pregnancy and birthweight of children with postpartum anaemia.Significant association was found between anaemia during postnatal period with haemoglobinlevel during pregnancy.(OR=2.64,95% CI = 1.14-8.08).No significant association was noted between birthweight of children with postpartum anaemia.

Table 1: Prevalence of postpartum anaemia in association with anaemia during pregnancy

Obstet-ric Details	Study subjects		Risk Estimates	
	Total	Anaemia Present	Unadjusted Odds Ratio (OR)	95% Confidence Interval (95% CI)
Haemoglobin level during pregnancy(gm/dl)*				
>11	63	15(23.8)	1	
<11	47	21(44.7)	2.64	(1.14-6.08)
Birth Weight (gms)**				
2501-3500	198	48 (24.2)	1	
≤2500	60	11 (18.3)	1.23	0.64-2.36
≥3501	32	09 (28.1)	1.22	0.53-2.82

*Information available for 110 subjects
** Information available for 290 subjects

No significant association was observed between type of iron supplementation, gestational age of starting iron supplementation and number of tablets consumed during pregnancy with anaemia during postnatal period as shown in table 2.

Discussion

The present study adds significant knowledge on effect of anaemia during pregnancy on haemoglobin levels during postnatal period. It also assesses the effect of iron and folic acid consumption during antenatal period with anemia during postnatal period.

Anemia in the antepartum period is identified as a major risk factor for developing postpartum

anaemia.[5]Center for Disease Control (CDC) recognizes anaemia at third trimester of pregnancy

Table 2: Association of iron supplementation during pregnancy with anaemia levels

Iron supplementation	Study subjects		Risk Estimates	
	Total No. (n=343)	Anaemia PresentNo (%)(n=91)	Unadjusted Odds Ratio (OR)	95% Confidence Interval (95% CI)
Type of iron supplementation				
Iron supplementation	340	88 (25.9)	1	
Blood transfusion	3	03 (100.0)	4.62	
Gestational age of starting iron supplementation*				
<4 months	112	28 (25.0)	1	
≥4 months	226	62 (27.4)	1.13	0.67-1.90
Number of tablets consumed during pregnancy*				
>100	320	84 (26.2)	1	
<50	8	03 (37.5)	1.68	0.39-7.20
50-100	10	03 (30.0)	1.2	0.30-4.76

***Information available for 338 subjects

as an important risk factor and it recommends all women who have anaemia in antepartum period to be screened for post-partum anaemia. Compromised prenatal iron status in anaemic pregnant women would limit the amount of available iron for reconstruction of iron stores after delivery.[6]In the present study, higher prevalence of anaemia was noted in mothers with lower haemoglobin level during pregnancy and the association was found to be statistically significant ; these findings concur with a study done in America[7] in 2001.

Anaemia during pregnancy has been found to be detrimental to featal growth and low birth weight has been frequently associated with anaemia[8]Significant difference was not noted with respect to prevalence of anaemia and birth weight of babies in a study conducted at Germany.[9] Our study was in conformity with these findings .

On an average, one gram of iron is required during normal pregnancy[10]Iron supplementation during pregnancy has shown to be a cost effective intervention in order to reduce prevalence of anemia in pregnancy and postpartum. It also improves maternal and foetal well-being.[11]

It is also stated that if six months of treatment cannot be provided in pregnancy, iron supplementation should be continued during postpartum period or dosage should be increased to 120 mg iron during pregnancy.[12]But systematic reviews on this topic recommend a dose of around 100 mg elemental iron and 350-500 mcg of folic acid daily for 16 weeks or more during pregnancy to be ideal.[13]Under the Indian National Nutritional Prophylaxis Programme iron tablets are supplied to children, adolescents, pregnant and lactating mothers. Through the programme all pregnant women are supplemented with prophylactic dose of iron and folic acid tablets containing 100 mg of elemental iron and 0.5 mg of folic acid every day for at least 100 days.[14]

Various studies have shown that between 6-12 weeks post-partum, mean hemoglobin values were significantly higher among women who were supplemented with iron prenatally than among women who had not taken iron supplements.[13,15, 16,]
It has been reported that women who took iron supplementation during pregnancy did not suffer the same postnatal reduction in hemoglobin as those who did not take iron supplementation.[16]Iron supplementation improves the iron stores of mother during pregnancy and during postnatal period even among women who enter pregnancy with low iron stores.[17]
Three postnatal women given blood transfusion during pregnancy continued to have anemia during postnatal period. Iron supplementation was in the form of iron and folic acid tablets [340 (99.1%)] and syrup for four (1.1%) subjects.

Anaemia in postpartum mothers who had consumed <90 iron tablets was found to be 76.4% compared to 59.6% in subjects who had consumed ≥90 iron tablets in a study done at Delhi.[18]In the present study, anaemia among mothers consuming <90 iron tablets was found to be 33.3%, in comparison with 26.2% among mothers consuming ≥90 tablets during pregnancy.

Conclusion and recommendation:

Iron supplementation during pregnancy did not have any bearing on prevalence of postpartum anaemia. The gestational age at which iron supplementation was started during pregnancy did not have any effect on prevalence of anaemia during postnatal period. Higher prevalence of anaemia was noted in mothers having lower hemoglobin level during antenatal period and was found to be statistically significant.Community based educational programmes should be initiated to increase awareness among mothers regarding consumption of IFA tablets on a regular basis and to dispel the myths and misconceptions related to its consumption.

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Original Research Article

A descriptive study on TV viewing habits among general population - Tamilnadu

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Date of Submission: 01.03.2016 **Date of Acceptance: 24.4.2016**

Abstract

Different changes were seen on TV viewing habits of population in recent years. **Objective:** To identify the frequency and time spent on watching TV , to categories and identify the programs preferred by population of different age group and to find out the influence of TV on behaviors of children and adolescents . **Methodology:** Chidambaram population is selected by convenient sampling .Data was collected by pretested proforma and analysis was done using descriptive statistics. **Results :** Out of 569 population surveyed from 150 houses holds 51.6% had dish connection , 62.6% of females watched TV for 1-3 hrs/day , males preferred (50%) News as first preference where as female's serials (49%), 32% of family reported to have dispute among family members for changing channel.**Conclusion:** The duration of TV viewing habits in general have increased in population.

Key words: TV viewing habits, program preferred, influence of TV.

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Introduction

Television is considered as an electronic carpet, which seems to transport millions of persons each day to far off places[1]. It is relatively a new medium that has made its implementation on every aspect of mundane life. It's reported that television made its visibility some more than sixty years ago Over a short span time, however it emerged as a remarkable medium of communication, entertainment and evaluation and education and has transformed our planet into a "Gigantic Electronic Village" bringing various people and continents close[2]. In India, television was introduced twenty five years after its invention and thirty years after its inception through government efforts introduce public service broadcasting . The idea was primarily education and access to rural population.

An average Indian home has cable and satellite access and the viewer gets information from local, national and global networks. The sheer number of channels gives him options of multiple natures. It is a powerful medium with extraordinary reach. No one can doubt its potential as catalyst of social change. Originally seen as entertainment for adults and older children, television in twenty-first century is watched by all age groups including infants.

Television has capability to provide substantial benefits for youngsters, when it is used with

awareness and for education purposes. Television programs that include violence events increase youngster's level of aggression and commercials shape consumption habit through youngsters. Exposure to scenes of violence matters role models on TV may increase direct, indirect, relational and social aggression in both girls and boys. Different changes were seen on TV viewing habits of youngsters in recent years. It is observed that the duration of TV viewing in general and the duration of watching TV alone have increased. This study includes general TV viewing habits and some associated problems related to it [3].

Objectives:

1. To identify the frequency and time spent on watching TV by population in Chidambaram

2. To categories the programs being preferred by the population

3. To identify the various reasons for watching that particular program

4. To find out the influence of TV on behavior of the children and adolescents.

Methodology

This study was conducted in Chidambaram, a field practice area under Rajah Muthiah Medical College, Annamalai University. Cluster sampling was done for this study.21 clusters were selected randomly and first 7 houses from each cluster were selected with a sample size of 150 households and 569 subjects.

A pretested proforma was used for the study and data was collected from a reliable informant, mostly mother. The proforma included socio demographic data and details regarding the frequency of watching TV, duration they spend before TV, nature of programs preferred and reasons for selecting the particular program.

The frequency of watching TV for the last one week was collected as always, most often, sometimes and rare. The time spent calculated as the average no of hours spent per day. The programs watched entered as the order of preference. The influence of TV on the behavior of the children and adolescents entered as perceived by the mother. The data further analyzed by calculating percentage, frequencies and cross tabulation techniques.

Results

Table 1.Sex distribution according to frequency of watching TV among study population

Variables	Always	Most often	Some times	Rare	Total
	NO %	NO %	NO %	NO %	NO %
MALE	9 3.1	36 12.2	132 44.7	118 40.0	295 51.8
FEMALE	14 5.1	60 22.0	148 54.01	52 19.18	275 49.2
TOTAL	23 4.04	96 16.9	280 49.2	170 30.0	569 100

Table 2. Reasons of watching TV in Study population

Particulars	Male	Female	Total
	NO %	NO %	NO %
Relaxation	44 14.9	57 20.8	101 17.7
Entertainment	92 13.1	123 44.8	215 37.7
Current affairs	88 29.8	4 1.4	92 16.1
Leisure	6 2.0	14 5.8	20 3.5
Time pass	60 20.3	70 3.6	130 22.8
Stress buster	5 1.7	6 2.2	10 1.8
TOTAL	259 51.5	274 47.5	569 100

Out of 150 households, 569 populations were surveyed. The mean number of TV per house was found to be 1.24, 30% of houses had child lock and 51.6% of TVs had dish connection. Majority of the study subjects (56.76%) were in the age group of 21-50 yrs (54.58% males and 59.12% females). Majority of the females were homemakers (62%). Majority (49.2%) opined that they watch TV only sometimes (54.01% females and 44.3% males) .

Table 3. Order of preference in watching TV in study population

PREFERENCE	MALE	FEMALE
FIRST	News	Serials
SECOND	Music	Movies
THIRD	Comedy	Reality show & cookery show

4% of respondents reported that they always watched TV (5.1% females and 3.1% males) .Majority of females watched TV for 1-3 hours per day (62.7%). 44.8% of females and 31.1% of males watched TV for entertainment; where as 29.8% of males were interested in current affairs. 50% of males reported News and 49% of females reported serial as their first choice. 32% of mothers agreed that dispute among family members in changing channels occur frequently. Mother's perception on negative influence of TV among children and other family members are as follows; affect studies (55.3%), physical activity (54%), eating (52%), mutual interaction (46%), social interaction (44%), sleep (39.3%), routine works (32%) and eye strain (12%).

Discussion

Most of the researches done on TV viewing habits have taken children as sampling unit. William (1986) [4] and Guntha (1955) have revealed that TV hardly affects the attitude of children. Lousey and Defluer (1988) showed in their research that children tend to watch more TV than do adults, prefer to watch adult programs and usually watch late into night as do adults. Adolescents continue to spend a great deal of their time watching TV.

In this study, almost 50% of mothers perceive that TV affect their children and other family members in day to day activities like sleeping ,eating habits, studies , interaction among the family members and with the neighbors.

The present study showed majority of females watched TV for 1-3 hours per day.5.1% of females always watched TV. In contrast to this a study conducted in young Indians by Kanwal (2011) reported no significant difference in frequency of watching TV between males and females. But females spend more time in front of TV as compared to males.

Kanwal observed that males preferred knowledge based programs and females mostly preferred watching movies. All the age groups consistently preferred reality shows, whereas news coverage was more preferred by higher age groups. In this study majority took the media as an entertainment (37.3%). Males preferred news (30%) as their first preference, whereas females serials (49%). The order of preference of programs for males was news, music and comedy respectively, whereas for females it was found to be serials, movies and reality shows and cookery shows.

50% of mothers reported that TV viewing habits reduces the physical activity of children. TV viewing habits has been extensively studied in relation to fatness, mainly among children and adolescents from developed countries. The available evidence indicates that there is a significant association between TV viewing and obesity among children[5-7]Association between TV viewing habits and overweight was not assessed in this study.

Conclusion: The study highlights the channels preferred and the various reasons among general population to watch TV. Main factors include males prefer News and Music, whereas females Serials and Movies.

Limitations: This study had various limitations .The data for entire population was collected from one family member mostly mother. Information bias and under reporting must have influenced this study. The influence of TV on children, adolescents and the family members in general one subjective as it is entered as perceived by the mother.

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Original Research Article

Knowledge, Attitude and Self-care practises of type 2 Diabetics towards Diabetes and its complications in a rural block of Haryana, North India

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Abstract

Background: Diabetes mellitus (DM) is a major public health problem with 3.2 million deaths attributed to diabetes every year globally. Poor awareness and practices about diabetes and its complications among diabetic patients are important variables influencing the progression of diabetes, which are largely preventable. **Objectives:** To study the knowledge, attitude and self care practices of patients suffering from type-2 Diabetes in a rural block of Ambala district in Haryana, North India. **Methods:** A hospital based cross sectional study was carried out among type 2 diabetics attending Non Communicable Disease Clinic (NCD) at General hospital (GH), Narayangarh, a Rural Health Training Centre attached to department of Community Medicine, PGIMER in district Ambala of Haryana during the period from 15 January to 31 March, 2014. Knowledge and self care practises were evaluated using a semi-structured pre tested questionnaire. **Results:** A total of 55 type 2 diabetes patients participated in the study. The patients' awareness regarding various aspects diabetes was found to be low whereas attitude of the participants for self-care was good. Only 20.0% of the patients regularly checked their blood sugar levels and only 27.3 % knew target blood glucose values. Around half (45.5%) of the patients thought that diabetes can be cured and very few (12.7%) knew about the need of extra care of foot in diabetes. Awareness about the complications was also quite low (38.8%) with heart (30.9%), eye (25.4%) and renal complications (20.0%) were most known ones. Around a quarter of patients (27.2%) still believed in herbal medications. **Conclusions**: The knowledge and practices scores were low in most areas of diabetes care whereas attitude scores were good emphasizing the need for additional educational efforts through a community based intervention.

Keywords: Attitude, diabetes, knowledge, self care practices

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Introduction

Prevalence of diabetes is increasing at an alarming rate particularly in developing countries. According to Diabetes Atlas published by International Diabetes Federation (IDF), diabetes affects at least 285 million worldwide and that number expected to reach 438 million by the year 2030.[1]Of all the chronic non-communicable diseases (NCDs), diabetes is associated with highest co-morbidities and complications and affects people from all socio-economic background.[2]

India harbours the largest number of diabetic patients in the world. The total number of diabetics in India was 41 million in 2006 would rise to 70

million by the year 2025.[3]Increased prevalence in India is attributed to the lifestyle transition coupled with urbanization, industrialization and lifestyle changes.[4]

Poor awareness and practises about diabetes and its complications among diabetic patients are some of the important variables influencing the progression of diabetes and its complications, which are largely preventable.[5] Complications from diabetes such as coronary artery and peripheral vascular disease, stroke, diabetic neuropathy, amputations, renal failure, blindness are resulting in increased disability, reduced life expectancy and enormous health cost to society. Undoubtedly, it is one of the most challenging public health problems of 21st century.[6]Recent data have illustrated the impact of socio-economic transition occurring in rural India in last 15 years and prevalence has risen from 2.4% to 6.4%.[7]

There are very few studies from India and mostly from southern India and Delhi to assess the knowledge, attitude and practises of diabetes patients towards diabetes and its complications.[8-12] The current study is one of the few studies from rural population in India. Findings of current study would help in development of future health education programmes or intervention targeting the disease in rural and semi-urban populations. With this background, present study was undertaken among diabetic patients to assess their knowledge, attitude and practices among diabetic patients.

Material and Methods

This cross sectional study was conducted among patients with type 2 diabetes mellitus(DM) attending the Non Communicable Disease(NCD) clinic run by department of community medicine, Post Graduate Institute of Medical Education & Research, Chandigarh at the sub divisional hospital of Narayangarh, a rural block in Haryana between 15 January, 2014 to 31st March, 2014. Health workers working in the area identified and motivated the diabetic patients living in this block to attend this clinic. All the diabetic patients who were aged more than 30 years and were already diagnosed with duration more than a year attending the NCD clinic were enrolled in the study after getting their informed consent. Privacy and confidentiality was ensured during the process of data collection and analysis. A total of 55 patients consented and participated in the study.

A medium-sized four part questionnaire to interview the participants was developed by the researchers which was then pilot tested on 05 patients attending the clinic to assess its feasibility and suitability of its content. Suitable modifications were done based on the findings of the pilot study. These patients of the pilot study were not included in final analysis. The first part of structured questionnaire contained information on socio-demographic variables of the patients, family history and drugs prescribed. The second, third and fourth part of the questionnaire contained information on knowledge, attitude and self care practises containing 28 questions in total (knowledge-15, attitude-04 and practice-09 questions). Each correct answer was given a score of ‘one’ and each wrong answer was given a score of ‘zero’.

Results

Patients’ characteristics and demographic profile

A total of 55 patients consented and participated in the study of whom 31(56.3%) were males and 24 (43.6%) females. Mean age of the participants was 54.4±7.8 years with the range of 36 to 74 years. Majority of them were; Hindu by religion (72.7%), in the age group of 51-60 years (43.6%), on oral hypoglycaemic only (80.0%) and having family history of diabetes (58.2%).Of the 55 patients, 43.6% (male = 08; female = 16) had received no formal education and for all educational levels, men had a higher overall percentage than women. A total of 36 (65.5%) patients belonged to lower class, 19(34.5%) to the middle class and none to upper class according to modified BG Prasad economic classification which is applicable for both urban and rural areas.[13] Most of the respondents (43.6%) has duration of illness between 5-10 years.

Knowledge of Diabetes and its complications

The response of the patients regarding the knowledge related questions are listed in table 1.

Table-1: Patients' Knowledge of diabetes and its Complications (N=55)

Questions to assess Knowledge	Participants giving correct response	Percentage of patient having correct knowledge
What is diabetes?	37	**67.3%**
What causes diabetes?	08	**14.5%**
What are the complications of diabetes?	21	**38.8%**
What is normal blood sugar level?	15	**27.3%**
Is diabetes hereditary?	23	**41.8%**
Is diabetes infectious?	21	**38.8%**
Can diabetes be cured?	30	**54.5%**
Is exercise beneficial for control of diabetes?	24	**43.6%**
Once controlled drugs can be stopped immediately?	23	**43.6%**
Is insulin habit forming?	15	**27.3%**
Is stopping Alcohol /smoking beneficial?	25	**45.4%**
Food items to be avoided?	11	**20.0%**
Is extra foot care required in diabetics?	07	**12.7%**
Is weight reduction required in controlling diabetes?	14	**25.4%**
Are you aware of blood sugar levels fall below normal when you are taking drugs?	12	**21.8%**

Table 2- Knowledge about various complications of diabetes in the participants (n=55)

Variables	No of Participants knowing about it	%
Heart related	17	**30.9%**
Eyes related	14	**25.4 %**
Renal complications	07	**20.0%**
Foot complications	04	**14.2%**
Stroke	02	**5.7%**

Table 3- Frequency distribution of respondents attitude and practises towards Diabetes

Questions	patients having positive attitude or good practises	
	Number	%
Do you think that regular exercise should be done by all diabetics?	42	77.1
Do you think that dietary control and modifications should be followed by all diabetics?	45	81.8
Do you think missing doses of your diabetic medication will have negative impact on your disease control?	44	80.0
Do you think that you should get checked for complications?	33	60.0
Do you regularly check your blood sugar (at least once a month)?	11	20.0
Do you regularly check your blood pressure (at least once a week)	06	17.1
Do you exercise regularly?	16	29.1

Do you include fruits in your diet regularly?	11	20.0
Do you take green leafy vegetables in diet?	16	29.1
Do you take medicines without missing dose?	17	30.9
Have you got your eyes checked in last 1 year?	11	20.0
Done routine investigation including lipid profile in last one year?	12	21.8
Do you take herbal Drugs?	15	27.2

With respect to knowledge about what diabetes means, more than half of the patients (67.3 %) could correctly answer that diabetes is a disease in which body contains a higher level of sugar in the blood than normal but only 08(14.5%) participants correctly knew regarding the cause of diabetes i.e. problem with insulin secretion by pancreas or utilization in the body. Around one third of the patients (38.8%) could correctly tell about one or more complications of diabetes. Knowledge of normal glucose level is important and desirable as it can lead to self-care and involvement of patient in management of DM. When participants were asked about the normal blood glucose levels, more than half of the patients (70.9%) did not know the normal blood glucose values i.e. 70–110 mg/dl. However, a good percentage (41.8%) of participants knew the hereditary nature of diabetes i.e. it runs in families. Only less than half of the patients (38.8%) % had the correct knowledge that diabetes is non-infectious. About half of the patients (45.5%) still believed that diabetes can be cured. More than half of the patients (56.4%) didn't know about the beneficial role of exercise in control of the disease. More than half of the patients (56.4%) wrongly believed that drugs may be stopped immediately after control. Very few (27.3%) of the patients knew that insulin is not a habit forming drug. Only 11 (20%) of the patients could correctly tell about the food items to be avoided in diabetes. Only few of them (21.8%) were aware of blood sugar levels falling below normal when on anti-diabetic drugs. Only 07(12.7%) patients correctly tell about the need of extra foot care in diabetics. Among the knowledge about complications of diabetes, renal and neurological complications were least known to patients. Most were afraid of heart related complications (table 2).

Attitude and practises in diabetes

The response of the patients regarding the attitude and practises related questions are listed in Table 3. Majority of the participants had positive attitude towards diabetic care but this was not being reflected in practice. Around 80.0% of the participants agreed that missing doses of diabetic medication will have negative impact on control of diabetes but only 31.4% of them were regularly taking their prescribed medications. Majority of the (77.1%) participants agreed that regular exercise should be done by all diabetics but only 16(29.1%) participants reported to do regular exercise. Around 82% of the participants agreed that dietary control should be followed by all diabetics but only 11(20.0)%) participants reported to regularly include fruits in their diet and only 16(29.1%) participants reported to include green leafy vegetables in their diet.

Discussion

Diabetes is an important cause of morbidity and mortality all over the world. Because of lack of awareness about diabetes, most patients with diabetes suffer from its complications and premature death[1].

Majority of the participants (43.1%) in our study were in the age-group of 51-60 years as disease usually comes in light after middle ages which is similar to the findings of the study by Priyanka et al and Shah et al[8, 9].

Overall knowledge about diabetes and its complications was low in our study population. Maximum knowledge was regarding what diabetes is (67.3%) and beneficial role of regular exercise in disease control (68.6%) while the least knowledge was regarding importance of foot care in diabetes (11.4%). A similar study done by Updhyay et al[15] in western Nepal in showed a mean score of 4.9 +/- 3.4 for knowledge which is lower than in our study. Another study conducted in Malaysia by Ding CH et al[16] in 2004 showed an overall knowledge score of 81.8% which is higher than in our study. This

difference may be due to differences in the educational and income level of the participants.

In our study, 67.3% of the study population knew what diabetes is which is higher than those found (46.63%) by a similar study by Shah et al[8] done in Saurashtra region of Gujrat but lower than those found by Khobragade et al[10] (85.9%) done in a tertiary care hospital in Delhi. In our study, only 27.3% of the study population had correct knowledge about the normal blood sugar levels which is a similar to the findings (28.2%) of study by Khobragade et al[10]

In our study population, only 38.8% had knowledge about the complications of diabetes while in a similar study by Deepa Mohan et al[18] in Chennai shows that 40.6% of self reported diabetic patients were aware about the complications of diabetes. The study by Khobrargade et al[10] reported that 47.6% of participants had knowledge about the complications of diabetes which is somewhat higher than our findings. This may be due to higher education level of the study participants in above study.

In our study population, the most known complications to the patients were heart disease (31.4%), eye problems (28.5%), renal disease (20.0%), foot problems (14.2%) and stroke (5.7%) while a similar study by Deepa Mohan et al[18] in Chennai showed that 23% knew about foot problems which is higher than our findings and 17.4% knew about kidney problems which is similar to our study results.

The positive attitude score in our study ranged from 57%-77% which is good. In a similar study done by C K Priyanka Raj et al[8] in 2005 in Bijapur, the positive attitude score ranged from 60-90% which is similar to our study results.

It is an established fact that healthy planned eating and regular exercise can delay diabetes and its complications.[17] In our study population, 29.1% were exercising regularly while the study by Khobragade et al[10] showed that 31.2% were practicing regular exercise similar to our findings. In our study population, only 22.8% were regularly checking their blood sugar level (at least once a month) while findings of study by Khobragade et al[10] reported 74.7% of the participants to be regularly checking their blood sugar levels. This wide variation might be due to low education and socio-economic level of the participants in our study.

Almost 85% of the participants in our study didn't know the cause of diabetes. This finding emphasizes that the average knowledge levels are low in community with higher diabetes prevalence[9].Since the study conducted among patients with type 2, the average age was between 51-60 years (43.6%) and average duration of diabetes among patients was 8.1 years. Nearly 60% of patients were from low socio-economical status and around 40% were illiterate. Since all the patients were recruited from government-run hospital, there may be bias regarding these two factor It has been shown that self-care among individuals with type 2 diabetes improved glycaemic control[19]and reduced complications[20]

Two main findings of our study which may be responsible for low diabetes knowledge among the patients were: 1) Nearly 65% of patients belonged to lower socio- economic strata and 2) Most important factor is low level of education, around 40% of the patients had not received formal education and another 29% were educated only up to 5th class. Therefore, low level of education may be the most important obstacle in diabetes management of such patients. It is rightly said that education of vulnerable communities can become a cost-effective public health strategy.[21]

Our study showed that people in rural areas wrongly believe that diabetes can be cured and allopathic drugs are harmful to the body. They also have many misconceptions about insulin like it is habit forming. They also have trust on herbal medications.

Limitations : As the study was restricted to a limited number of patients, it may not fully represent people from all socio-economic classes as it's a general observation that people mainly from lower socio-economic class come to government hospitals for their treatment leading to overall low score in our study. Additional investigation in a larger sample size covering patients from all socio-economic backgrounds is required to replicate and extend the findings of the study.

Conclusion : The awareness towards various aspects of diabetes among the study participants was found to be low. Although the participants had positive attitude towards self care but that was not

being reflected in their practices. There is need of educational programme on various aspects including self-care for the diabetics. There should be increase in IEC/BCC particularly in rural areas in terms of campaigns on diabetic complications, awareness regarding dietary control and regular exercise, regular monitoring of blood sugar, regular routine check-ups and foot care. Media and Non-government Organisation (NGOs) both should in combination for removing misbelieve, ignorance and instituting diabetes preventive measures in the community.

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Original Research Article

Perceptions About Mental Illnesses Among Rural Community In Raichur, Karnataka

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Abstract

Background: Mental health disorders are always neglected due its non-specificity in diagnosis, vague symptoms and various beliefs and myths. This study was planned to understand the perceptions as well as health seeking behaviour among rural population **Objectives:** To know the perceptions and beliefs of mental health disorders and health seeking behaviour among rural community in Raichur, Karnataka. **Methods:** A cross –sectional study was conducted in rural field practice area of Navodaya Medical College, Raichur. A total of 100 randomly selected people were interviewed with pre tested questionnaire. Results were analysed using SPSS software. **Results:** Study comprised 52% males and 96% married subjects. Most of them (65%) were Hindus. 70% of the subjects felt mental illness is due to mental causes like stress, emotional excitements etc. 18% of the people believed mental illnesses are due to supernatural causes and 42% of the subjects believed excessive talking is the main symptom of mental illness, 60% felt unusual behaviour is the symptom of mental illness. 88% think mental illness is curable. 20% people told spiritual healer is the best to cure mental illness followed by general practitioner. **Conclusions:** This study clearly shows misconceptions are very much common among our rural people and proper education is the need of hour so that we can bring positive attitude among our countrymen and improve their mental health.

Key words: Mental Illness, Perception, Rural community, Raichur

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Introduction

Mental disorders are not the exclusive preserve of any special group; they are truly universal. Mental disorders are always neglected due its non-specificity in diagnosis, vague clinical symptoms, varied treatment and various myths and beliefs leading to social stigma. Mental and behavioural disorders are found in people of all regions, all countries and all societies.

As per analysis done by WHO 450 million people were estimated to be suffering from neuropsychiatric conditions [(1)]. Mental and behavioural disorders are present at any point in time in about 10% of the adult population worldwide. DALY lost due to psychiatric disorders is estimated to be 11.5% which is much higher than diarrhoea, malaria, worm infestations, HIV and TB if taken individually [(2)].

During the last two decades, many epidemiological studies have been conducted in India. The prevalence reported from these studies range from 10 to 370 per 1000 population in different parts of the country [(3) (4)].

For long the mentally ill were considered to be possessed by devils. Patients were locked up in tall jail-like buildings, far removed from the centres of population, alienated from the rest of the society. People in rural part of our country still think supernatural powers are the reasons behind these mental illnesses. Besides limited number of psychiatrists in rural India, problems of low literacy with associated stigma and misconceptions about mental illnesses are major challenges in preventing and treatment of mental illnesses. The belief that mental illness is incurable or it is due to evil spirit can also be damaging, leading to patients not being taken for appropriate mental health care[(5)]. Hence this study focuses on perceptions and beliefs about mental illnesses and health seeking behaviour among rural population.

Materials & Methods:

A cross sectional study was conducted in rural field practice area of Navodaya Medical College Raichur of Karnataka state. There are 6 villages under the primary health centre of Navodaya Medical College. One village was randomly selected. All adults above 18 years in the village who volunteered for the study were listed which constituted our sample frame. 100 subjects were selected through systematic random sampling. A performa was prepared to collect the information about perceptions towards mental illnesses by reviewing literature.

Data was entered in Excel spread sheet and analysed using SPSS software. Results were presented as proportions of the total sample.

Results:

Socio-Demographic characteristics (Table 1)

A total of 100 subjects were recruited in the study. Mean age of the study population was 42.81 years (SD 13.4). Majority were in the age group of 25-35 years. There were more males (52%) than females.

Perceptions about mental illness

Most of the participants (42%) think that continuous excessive talking, talking to himself, aimless roaming are the important symptoms of mental illness. 30% of study population felt loss of memory, aggressive behaviour are the indicators of mental illness. 60% of the people said unusual behaviours like sudden change in mood or remaining calm for some time followed by over talkativeness are the symptoms of mental illness.

Most of the people (70%) agreed that stress is the main cause for mental illness. 22% felt thinking too much without sharing emotions with others is the cause for mental illness. 36% told family conflicts like quarrel with spouse or in laws, separation from family, loss of children could be the cause for mental illness. 18% told intrusion of evil spirits can lead to mental illness.

Most of the participants (88%) felt mental illness can be cured. One in five participants told these are not completely curable. 35% perceive having calm life without tensions can prevent the mental illness however 15% told it cannot be prevented.

Many participants (78%) feel mentally affected people should be treated in specialised hospital under the care of psychiatrist but 20% of the study

Table 1: Socio-demographic characteristics of study population (N=100)

Socio-demographic factors	Frequency
Age Groups (yrs)	
18-25	22
25-35	35
35-45	15
>45	28
Gender	
Males	52
Females	48
Occupation	
Skilled labours	64
Semi professional	14
Unskilled labours	22
Marital Status	
Married	96
Unmarried	4
Education	
Literate	84
Illiterate	16
Religion	
Hindus	65
Muslims	35

Table2: Perceptions of mental illness

Sl. No	Questionnaire Item	Proportion (%) of subjects who answered Yes
1	Do you think excessive talking/talking to himself/ aimless roaming are the symptoms of mental illness?	42%
2	Do you think loss of memory/ aggressive behaviour is the symptoms of mental illness?	30%
3	Do you think unusual behaviours like sudden change in mood/over talkativeness are the symptoms of mental illness?	60%
4	Do you think stress causes mental illness?	70%
5	Do you think family conflicts can cause mental illness?	36%
6	Do you think evil spirits can cause mental illness?	18%
7	Do you think mental illness can be cured?	88%
8	Do you think calm life can prevent mental illness?	35%
9	Do you think mentally affected people should be treated in specialised hospital?	78%
10	Do you think traditional healers, spiritual healers can cure mental illness?	20%

participants perceive that it can treated with the help of traditional healers, spiritual healers like consulting swamijs etc

Discussion:

This study was conducted to know the perceptions about mental illnesses among rural community. Many people were not aware of the common symptoms of mental illness like depression, anxiety and they never thought that mental illness could be present even in normal looking person without excessive talking or aggressiveness.

Many participants felt stress in life can be the cause for mental illness. Study conducted by Singh et al. [6] showed similar findings. Our study findings were also consistent with Salve et al[7]. study. Intrusion of evil spirits is still perceived as cause of mental illness among substantial proportion of people like in studies conducted in various parts of our country [8-11]. This is mainly due to lack of awareness among our people.

Only positive perception among our study population was regarding treatment aspect, many felt that mentally ill people should be treated in a hospital under the care of psychiatrist. 20% of the subjects still feel the need of traditional healers which is really a huge number and is a challenge for health care providers. Similar findings were observed in many previous studies [12,]

Conclusion:

This study shows the lack of awareness about mental illness in the community and there is urgent need for creating awareness about symptoms and easy identification of mental illnesses. Health education and increase in public awareness regarding mental illness can improve identification, health seeking behaviour and in turn better care of the mentally ill people. This will eventually help in reducing burden of psychiatric morbidity in the community.

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Original Research Article

Epidemiology of Joint Pain Reported In a Tertiary Hospital in Tamil Nadu

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Abstract

Patients routinely seek medical attention for joint pain, and it is one of the leading causes of disability. This study was conducted to estimate the prevalence of difference sites of joint pain reported by patients attending a tertiary care hospital. A cross sectional study was carried out among 10004 patients who have attended the orthopedic outpatients department in a government tertiary care hospital in Tamil Nadu. The mean age of the patients attended the orthopedic outpatient department 53.20 years, for males it was 56.06 years and for females it was 48.94 years. The most common joint affected among male patients was knee joint (51.05%), followed by low back pain (16.28%), shoulder pain (7.26%), elbow pain (6.30%) and neck pain (6.29%). In case of female patients the most common joint affected was knee joint (26.18%), followed by low back pain (17.18%), shoulder pain (16.93%) and ankle pain (10.15%). There is a need to develop an appropriate strategy for early identification and treatment of these cases at primary care levels and also to educate on the risk of joint diseases to prevent them.

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Introduction

Globally, it has been estimated that 1 in 5 adults suffer from pain and another 1 in 10 adults are diagnosed with chronic pain each year.[1] Joint pains were the most common symptoms for which people seek medical care that affects hundreds of millions of people world wise which were responsible for the long term disability. The prevalence of many of joint pain increases markedly with age, and many are affected by lifestyle factors, such as obesity and lack of physical activity. The increasing number of older people and the changes in lifestyle throughout the world mean that the burden on people and society will increase dramatically. [2]

Musculoskeletal pain, especially joint and back pain, is the most common type of chronic pain. The most common cause of joint pain is related to arthritis, of which there are numerous types. Arthritis affects 15% people which comes over 180 million people in India. This prevalence is higher than many well known diseases such as diabetes, AIDS and cancer. [3] Patients routinely seek medical attention for joint pain, and it is one of the leading causes of disability. This study was conducted to estimate the prevalence of difference sites of joint pain reported by patients attending a tertiary care hospital.

METHODOLOGY

A cross sectional study was carried out among 10004 patients who have attended the orthopedic outpatients department in a government tertiary care hospital in Tamil Nadu for a period of 6 month from July2015 to December 2015 to find out the prevalence of different types of joint pains, age and sex wise distribution. Data were entered on Microsoft Excel spread sheet and analyzed using standard statistical software packages. Descriptive data were presented as simple proportions.

RESULTS

The mean age of the patients attended the orthopedic outpatient department 53.20 years, for males it was 56.06 years and for females it was 48.94 years. Table 1 depicts the age distribution of the patients attending orthopedic out patients of tertiary care hospital. Out of 10004 patients attended for a period of 6 months 59.9% were males and 40.1% were females. About 35.28% were in the age group of 40-59 years followed by 35.1% in the age group of 60-69 years.

Table 2 shows age sex distribution of patients with different types of joint pains attending orthopedic outpatient department of tertiary care hospital. The most common joint affected among male patients was knee joint (51.05%), followed by low back pain (16.28%), shoulder pain (7.26%), elbow pain (6.30%) and neck pain (6.29%). In case of female patients the most common joint affected was knee joint (26.18%), followed by low back pain (17.18%), shoulder pain (16.93%) and ankle pain (10.15%). Compared to female the proportion of male patients with knee pain and elbow pain was higher compared to female. The proportion of females with shoulder pain and ankle pain was higher in females compared to male patients.

Table 3. Shows age distribution and sites of pain. Higher prevalence of knee joint pain (59.45%) was reported in the age group of 60-79 followed by 40-59 age group (43.51%). It was noted that prevalence of was lower (7.87%) in the age group of 20-39 years compared to other age group. The prevalence of shoulder pain was more (27.03%) in the age group of 20-39 years compared to other age group. Ankle pain was higher (24.07%) in the age group of less than 19 years followed by 20-39 years with 17. 83 percent. About 34.25 % of patients below the age group 19 had elbow joint pain and 3.7 % had wrist joint pain.

Table 1. Age and sex distribution of the study population

Age in years	Male (n=5988) (%)	Female (n=4016) (%)	Total (n=10004) (%)
19 & below	75(1.26)	33(0.82)	108(1.07)
20-39	802(13.39)	1344(33.46)	2146(21.45)
40-59	2081(34.75)	1449(36.5)	3530(35.28)
60-79	2530(42.25)	982(24.45)	3512(35.10)
80 & above	500(8.35)	208(5.18)	708 (7.07)
Total	**5988(59.9)**	**4016(40.1)**	**10004(100)**

Table2. Age and sex distribution of joint pain

Type of joint pain	Male (n=5988) (%)	Female (n=4016) (%)	Total (n=10004) (%)
Both knee pain	982(16.39)	572(14.24)	1554(15.53)
Left knee pain	960(16.03)	181(4.51)	1141(11.40)
Right knee pain	1115(18.62)	326(8.12)	1441(14.40)
Total knee pain	**3057 (51.05)**	**1079 (26.87)**	**4136 (41.34)**
Low back pain	993(16.58)	690(17.18)	1683(16.82)
Left shoulder	132(2.20)	346(8.61)	478(4.78)
Right shoulder	303(5.06)	334(8.32)	637(6.37)
Total shoulder pain	**435 (7.26)**	**680 (16.93)**	**1115 (11.14)**
Neck pain	377(6.29)	572(14.24)	949(9.49)
Multiple joint pain	430(7.18)	375(9.33)	805(8.05)
Left ankle	94(1.56)	302(7.52)	396(3.96)
Right ankle	176(2.93)	106(2.63)	282(2.82)
Total ankle pain	**268 (4.47)**	**408 (10.15)**	**676 (67.57)**
Right elbow pain	190(3.17)	98(2.44)	288(2.88)
Left elbow pain	188(3.13)	35(0.87)	223(2.23)
Total elbow pain	**378 (6.30)**	**133 (3.31)**	**511 (5.10)**
Right wrist pain	41(0.68)	41(1.02)	82(0.82)
Left wrist pain	0(0.0)	30(0.74)	30(0.30)
Total wrist pain	**41 (0.68)**	**71 (1.77)**	**112 (1.12)**
Right hand	6(0.10)	0(0.0)	6(0.06)
Right ac joint	1(0.01)	5(0.10)	6(0.06)
Left ac joint	0(0.0)	3(0.07)	3(0.03)
Tota; ac joint pain	**1 (0.01)**	**8 (0.2)**	**9 (0.8)**

Table 3. Age distribution and joint pain

Type of joint involved	<19 years (%)	20-39 years (%)	40-59 years (%)	60-79 years (%)	80 & above (%)	Total (%)
Left knee	7	50	358	675	51	1141
Right knee	26	82	667	614	52	1441
Both knee	0	37	538	799	180	1554
Total knee pain	**33(30.6)**	**169(7.9)**	**1563(43.5)**	**2088(59.5)**	**283(39.9)**	**4136(41.3)**
Low back pain	1	291	617	545	229	1683
Left shoulder	4	305	26	130	13	478
Right shoulder	0	275	224	133	5	637
Total shoulder pain	**4(3.7)**	**580(27.0)**	**250(7.1)**	**263(7.5)**	**18(2.5)**	**1115(11.1)**
Neck pain	0	315	392	168	74	949
Multiple joint pain	0	203	192	324	86	805
Left ankle	26	258	112	0	0	396
Right ankle	0	125	35	104	18	282
Total ankle pain	**26(24.1)**	**383(17.8)**	**147(4.2)**	**104(2.9)**	**18(2.5)**	**676(6.7)**
Right elbow	30	30	212	16	0	288
Left elbow	7	95	121	0	0	223
Total elbow pain	**37(34.3)**	**125(5.8)**	**333(9.4)**	**16(0.5)**	**0**	**511(5.1)**
Right wrist	3	44	35	0	0	82
Left wrist	1	29	0	0	0	30
Total wrist pain	**4(3.7)**	**73(3.4)**	**35(0.9)**	**0**	**0**	**112(1.1)**
Right hand	0	6	0	0	0	6
Right ac joint	0	1	1	4	0	6
Left ac joint	3	0	0	0	0	3
Total	**108(1.1)**	**2146(21.5)**	**3530(35.3)**	**3512(35.1)**	**708(7.1)**	**10004(100)**

DISCUSSION

In our study the most common joint pain among the patient attending orthopedic outpatient was knee joint pain. Similar findings were reported by Fernandez- Lopez JC et al in Spain , Sharma R et al in India, Health Care Surveys and the National Health Interview Survey in United States and Kiyoshi Aoyagi et al in Japan.[4-7] In the present study the most common joint affected among male and female patients were knee joint followed by low back pain and shoulder pain similar findings were reported by Sharma R et al India in the ICMR study , Dai et al , Chopra et al [5,8,9] but in contrast Zeng et al and Abdul Kabir dar et al reported low back pain as most common pain followed by Knee and neck pain. [10,11]

Knee joint pain

Age is the one of most important risk factor for knee joint pain due to osteoarthritis in the present study among the patients attending the orthopedics department and the rate of patients attending the outpatients department increases with age and it was more evident after the age of 40 years.It was after 50 years of age as reported by Mohamed Ahmed et al [12] more males were attending the out patients department for knee pain compared to females. In contrast in community based study the prevalence of knee joint pain were higher in females compared to males as reported by Sharma R et al India in the ICMR study, Arvind chopra etal and Vaijayanthi lagu joshi et al.[5,9,14] As this is a hospital based study it clearly showed the health seeking behavior of females were lower compared to males.

Shoulder joint pain

In the present study nearly one tenth of the patients attending the orthopedic out patients department complained of shoulder pain. The rate female patients attending for shoulder pain was two times higher compared to males. A similar finding of higher prevalence of shoulder pain was reported by Arvind chopra et al both in urban and rural community based study.[9] In the present study

higher prevalence of shoulder pain was noted in the age group of 20-39 compared to other age groups the reasons for this has to be studied further.

Elbow joint pain

About 5% of the patient attending outpatient department of orthopedics reported elbow joint pain. Male patients outnumbered female. Prevalence of Elbow joint pain was higher in the age group of less than 19 years compared to other age groups the reason being has to further researched. Arvind Chopra et al reported higher prevalence among females compared to male in community based study.[8] In the present study higher number of males were seeking medical care for elbow joint which could be due to higher health seeking behavior among males compared to females.

Neck pain

Nearly one fifth of the patients reported neck pain in the present study. Female had a higher prevalence compared to males. Similar findings of higher prevalence of neck pain were reported by Arvind chopra.[9]

Other joint pains

In our study except for knee joint pain and elbow pain all other types of pain was higher in females compared to males. Sharma et al , Chopra et al and Vijayanthi et al had reported all joint pains were higher in females compared to males.[5,13,14]

Limitation of the study was the study was under taken in a tertiary care hospital thus it will not truly reflect the prevalence of different types joint pain in the community and but indicated health seeking behavior for joint pain in both males and females.

CONCLUSION: There is a need to develop an appropriate strategy for early identification and treatment of these cases at primary care levels and also to educate on the risk of joint diseases to prevent them. In comparing with other studies there gross difference in seeking health care for knee pain was noticed as more males were attending the outpatient especially for knee joint in compared to female with higher prevalence in the community.

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Original Research Article

Availability and Utilisation of Socially Marketed Health Care Products in Mandya City, Karnataka

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Abstract

Background: Many studies can be found which addresses contraceptive use like condoms & oral contraceptive pills (OCPs) and also about the awareness and use of ORS. We could not locate any study that focused specifically on awareness and use of socially marketed products (SMP) like condoms, oral contraceptive pills (OCPs) and Oral rehydration Salt (ORS). Objectives: To assess the knowledge, availability of socially marketed products in medical stores of Mandya city and to assess the utilization of socially marketed products among people of Mandya city. Methodology: Study design: Community based cross-sectional study. Purposive sampling of all the 102 registered pharmacies and 510 consumers were administered a pre-designed, semi structured questionnaire. **Results:** 89 (87.25%) Pharmacists were aware of the concept of SM and only 84 (82.35%) were selling any SMP. Customer awareness about SMPs was higher for condoms as compare to OCPs or ORS. The reason for utilization are recommendation by health care personnel 167(61.34%), easy availability 121(44.48%), reasonable cost 105(38.60%), peers influence 66(24.26%) and advertisements 53(19.48%). 235(86.39%) were of the opinion that the quality of the socially marketed products was satisfactory. 140(51.47%) opined availability of socially marketed products needs to be increased. With increasing education level the awareness, ever use and recommendation for future use of SMP increased. However, as socio-economic status increased the usage and peer recommendation of SMP decreases. **Conclusion:** The knowledge and attitude about SMP among pharmacists was good and favorable. Availability of SMP depended on ease of procurement, availability of distributors and customer demand. More than three fourth of the pharmacists opined they were satisfied with SMP's profit margin and were motivated to continuing the sales of SMP.

Key words: Social Marketing, Medical Stores, Urban population, Condoms, MALA-D, ORS pack

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Introduction

Marketing aims to boost the sales of products and services of a product, and help a company earn profit. Social marketing works differently from the traditional way of commercial marketing as it incorporates the wellbeing and growth of the society along with the profit to the seller.[1]

The goal of social marketing is to use the available marketing outlets for social action. Aggressive salesmanship, build-up of public opinion by strong promotional & education activities, elimination of middle men are the strategies to reaching potential consumers with attractive benefits to the society at large.

In social marketing, commercial marketing concepts, tools, resources, skills & technologies are applied to encourage socially beneficial behaviour among those segments of population not served or

not adequately served by the existing public or private systems.

India is the first country in the world that has accepted this concept for family welfare program through Public-Private-Partnership (PPP). Many companies manufacturing fast moving consumer goods have co-operated with the government in social marketing of condoms, oral contraceptive pills (OCPs) and oral rehydration salt (ORS).

Inspite of the techniques of commercial enterprises being applied in social marketing, it offers the consumer a definite advantage in terms of low or subsidized price, with effective quality made available conveniently.

Kotler and Zotman defined social marketing as "The design, implementation and control of programs calculated to influence the acceptability of social ideas and involving considerations of product planning, pricing, communication, distribution and marketing research".[2]

Social Marketing is based on understanding the need specific behaviour, knowledge, practices and belief systems prevailing in the community, media coverage of the health services, community participation, and awareness regarding how social marketing schemes change the health behaviour of the community in a most appealing way in a low cost.[1]

Social marketing is a three tier system which includes policy making at headquarters level and program support at regional level and adopted at field and operation level. Good or lack of sufficient evaluation lead these programs success or failure, public health programs merely provide information but fail to trigger the risk behaviour for the disease.[3]

Social marketing can be a powerful tool to improve accessibility to the health services and has the potential to reduce burden on the public sector by shifting clients who can pay to the private sector. Pharmacists play a great role and form an important link to maintain the stock, educating & promoting the consumers in the correct use of the products.[4]

Therefore, availability of socially marketed healthcare products by these service providers play a great role in achieving the product delivery to the community. The present study will be conducted for availability and utilization of socially marketed health care products in medical stores of Mandya city, Karnataka

Objectives:

1. To assess the knowledge about socially marketed products among the pharmacists of Mandya city.
2. To assess the availability of socially marketed products in the medical stores of Mandya city
3. To assess the utilization of socially marketed products among people of Mandya city

Methodology:

This community based cross-sectional study was conducted in Mandya city. It is a city in south Karnataka with a population of 1,37,358 (census 2011). Mandya has 108 registered pharmacy stores within the city. All the registered pharmacy stores were included in the survey. This study was conducted from October to December 2015.

Study design: Community based cross-sectional study.

Study period: October to December 2015

Sampling method: Purposive sampling

Sample size: All the registered pharmacies within Mandya city (108) and 510 customers who came to the pharmacies.

Study tool: Knowledge about socially marketed products and the availability of socially marketed products in the pharmacy stores among the pharmacists was assessed by a self administered, pre-designed, pre-tested, semi-structured questionnaire. All the 108 registered pharmacies were contacted for the study. The pharmacists of the registered pharmacies who gave informed consent to participate in the study were included. 102 (96.23%) registered pharmacies of Mandya city participated in our study. The remaining 6 registered pharmacies were either not available for interview as they were found to be locked in spite of 3 repeated visits or denied consent. The data was collected regarding awareness about social marketing products, availability of these products, information about the distributors of the products, selling price for the customers, provision of similar products of brands other than those under social marketing and consumer demand for three common socially marketed products namely condoms, OCPs and ORS.

To assess the utilization of socially marketed products, 5 adults who were aged more than 18 years and consented to participate in the study were interviewed in each pharmacy, using a pre-designed, pre-tested, semi-structured questionnaire. Data was collected regarding socio-demographic details, awareness about socially marketed products, availability of these products, cost of these products, cost of similar products sold of brands other than those under social marketing, attitude towards socially marketed products and the utilization of socially marketed products was collected for a total of 510 persons who were interviewed. The data collected was entered in Microsoft excel software.

The data was analysed and ddescriptive statistics were derived in percentages. Chi square test was used to determine whether there is a significant association between the variables. Epi-info software was used to determine whether association exists between the variables.

Results:

All the 108 registered pharmacies of Mandya city were contacted for the study. 102 (96.23%) registered pharmacies participated in this survey. The remaining 6 registered pharmacies were either not available for interview or did not consent to participate in the study. A total of 102 head pharmacist of the consenting registered pharmacies were administered the questionnaire.

Of the 102 pharmacists, 89 (87.25%) were aware of the concept of social marketing and regarding socially marketed products in health (see table 1 for more details). 63 (61.76%) pharmacists correctly listed the 3 products that were socially marketed, 19 (18.63%) listed 2 socially marketed products and 7 (6.87%) listed only one product. The remaining 13 (12.75%) were not sure of the concept or products of social marketing. Condoms were the most commonly mentioned social marketed product, followed by OCPs and ORS.

Table.1: Knowledge regarding socially marketed (SM) products among registered pharmacists of Mandya City

SM product	Awareness	Selling
Condoms	89 (87.25%)	84 (82.35%)
OCPs	78 (76.48%)	56 (54.90%)
ORS	71 (69.61%)	nil

Condoms were the most commonly sold social marketed product, followed by OCPs. Of the 102 registered pharmacies, 84 (82.35%) pharmacies sold socially marketed condoms while 56 (54.90%) sold socially marketed OCPs. None of the pharmacies sold socially marketed ORS.

Among the 102 study subjects, 82 (80.39%) gained knowledge regarding social marketing, when they were pursuing their Bachelors in Pharmacy (B. Pharm) degree. Hence the most common source of knowledge was academic. 54 (52.94%) opined that their source of knowledge was from fellow pharmacists or peers. 27 (26.47%) had gained knowledge regarding social marketing from the distributors of various social marketing products. 25 (24.51%) pharmacists had the contact information of the distributor, to replenish the stock of the socially marketed products. The remaining relied on the distributors coming to the pharmacy to replenish the stock.

The attitude of the 89 study subjects who had knowledge regarding socially marketed products, aspects like profit-margin, costumer demand and motivation to sell socially marketed products were assessed. Of the 89 study subjects, 84 (94.38%) pharmacists were selling them, 78 (87.64%) felt that social marketing was a good strategy to make health products available to a wider population. The remaining neither had a positive nor a negative attitude towards the usefulness of social marketing.

Of the 84 pharmacists who were selling socially marketed products, 72 (85.71%) opined that the profit margin was adequate while 12 (14.28%) opined sales would increase if the profit margin was more. All the 84 pharmacists were of the opinion that in order to increase consumer demand, advertising needs to be increased. 74 (88.10%) and 68 (80.95%) pharmacists opined advertising on television and bill boards would be the ideal media to reach more number of consumers respectively.

Of the 84 who were selling socially marketed condoms, 76 (90.48%) opined that only about 50% of the consumers demanded condoms that are socially marketed. Thrill (38 (45.24%)), Masthi (28(33.33%)), Nirodh (27(32.14%)) and Fire (16(19.04%)) were the different brands of condoms sold under social marketing.

52 (61.90%) pharmacists opined that about 30% preferred other brands over socially marketed condoms. Kamasutra (51(60.71%)), Kohinoor

Table.2: Socio-demographics, knowledge & practices among consumers regarding socially marketed product Condoms

Socio-demographics	Social marketing of condoms			
	Knowledge	Ever Used	Recommended	Total
Males	254 (86.98%)	213 (72.95%)	190 (65.07%)	292 (57.25%)
Females	142 (65.13%)	59 (27.06%)*	47 (21.56%)	218 (42.54%)
20-29 years	134 (80.72%)	96 (57.83%)	89 (53.61%)	166 (32.54%)
30-39 years	174 (82.85%)	118 (56.19%)	97 (46.19%)	210 (41.18%)
40-49 years	88 (65.67%)	58 (43.28%)	51 (38.06%)	134 (26.28%)
Primary school	71 (73.20%)	46 (47.42%)	41 (42.27%)	97 (19.02%)
High school	201 (83.40%)	152 (63.07%)	128 (53.11%)	241 (47.25%)
College	124 (72.09%)	74 (43.02%)	68 (39.53%)	172 (33.72%)
Poor	98 (80.33%)	70 (57.37%)	65 (53.27%)	122 (23.92%)
Lower middle class	119 (75.31%)	99 (62.65%)	91 (57.59%)	158 (30.98%)
Upper middle class	121 (82.87)	82 (56.16%)	71 (48.63%)	146 (28.62%)
Rich	58 (69.05%)	21 (25.00%)	10 (11.90%)	84 (16.47%)
Total	396 (77.64%)	272 (53.33%)	237 (46.47%)	510 (100%)

*reported use by their partners

Table.3: Socio-demographics, knowledge & practices among consumers regarding socially marketed products Oral contraceptives (OCPs)

Socio-demographics	Knowledge	Practiced	Recommended	Total
Males	158 (54.11%)	70 (23.97%)*	66 (22.60%)	292 (57.25%)
Females	161 (73.85%)	126 (57.79%)	122 (55.96%)	218 (42.54%)
20-29 years	115 (69.28%)	82 (49.39%)	81 (48.79%)	166 (32.54%)
30-39 years	142 (67.62%)	81 (38.57%)	79 (37.62%)	210 (41.18%)
40-49 years	62 (46.26%)	33 (24.62%)	28 (20.89%)	134 (26.28%)
Primary school	43 (44.33%)	21 (21.65%)	18 (18.55%)	97 (19.02%)
High school	150 (62.24%)	88 (36.51%)	84 (34.85%)	241 (47.25%)
College	126 (73.25%)	87 (50.58%)	86 (50.00%)	172 (33.72%)
Poor	77 (63.11%)	48 (39.34%)	46 (37.70%)	122 (23.92%)
Lower middle class	109 (68.98%)	70 (44.30%)	69 (43.67%)	158 (30.98%)
Upper middle class	106 (72.60%)	62 (42.46%)	62 (42.46%)	146 (28.62%)
Rich	27 (32.14%)	16 (19.04%)	11 (13.09%)	84 (16.47%)
Total	319 (62.54%)	196 (38.43%)	188 (36.86%)	510 (100%)

Table.4: Socio-demographics, knowledge & practices among consumers regarding socially marketed product Oral Rehydration Salt (ORS)

Socio-demographics	Knowledge	Ever practiced	Will Recommend	Total
Males	27 (9.25%)	10 (3.42%)	66 (22.60%)	292 (57.25%)
Females	45 (20.64%)	22 (10.09%)	122 (55.96%)	218 (42.54%)
20-29 years	20 (12.05%)	Nil	81 (48.79%)	166 (32.54%)
30-39 years	29 (13.81%)	11 (5.23%)	79 (37.62%)	210 (41.18%)
40-49 years	23 (17.16%)	21 (15.67%)	28 (20.89%)	134 (26.28%)
Primary school	16 (16.49%)	6 (6.18%)	18 (18.55%)	97 (19.02%)
High school	32 (13.27%)	19 (7.88%)	84 (34.85%)	241 (47.25%)
College	24 (13.95%)	7 (4.07%)	86 (50.00%)	172 (33.72%)
Poor	18 (14.75%)	9 (7.37%)	46 (37.70%)	122 (23.92%)
Lower middle class	30 (18.98%)	15 (9.49%)	69 (43.67%)	158 (30.98%)
Upper middle class	21 (14.38%)	8 (5.47%)	62 (42.46%)	146 (28.62%)
Rich	3 (3.57%)	Nil	11 (13.09%)	84 (16.47%)
Total	72 (14.11%)	32 (6.27%)	22 (4.31%)	510 (100%)

(41(48.81%)) & Moods (18(21.43%)) were the leading brands of condoms on sale, that were not socially marketed. Each brand of condoms was supplied by a different distributor or supplier. However, all the pharmacists opined that they would continue to sell socially marketed products condoms.

However, 18 (17.65%) out of 89 pharmacists were not selling any socially marketed condoms. The common reasons for not selling socially marketed condoms were that the distributors did not replenish the stocks. Other reasons cited by pharmacists were that there is not much demand for socially marketed condoms by the people and profit margin being better in sales of non socially marketed brands. All these 18 pharmacists exclusively sold condoms that were not socially marketed.

Of the 102 pharmacists, 78 (76.48%) had knowledge of OCPs being socially marketed. However 56 (54.90%) were selling them. Mala-D was the trade name of the socially marketed OCPs and there was only one distributor for this product. Of the 56 who were selling Mala-D, 31 (55.36%) opined that about 70% of their OCPs sales was Mala-D, who bought Mala-D with or without prescription.

Of the 78 who knew about Mala-D, 32 (41.02%) were not selling Mala-D. The most common reason for not selling Mala-D was that the distributor did not replenish the stocks (20(62.50%)). The other reasons were that there is not much demand for Mala-D (13(40.62%)) and prescriptions were usually for other brands (9(28.12%)). All these 32 pharmacists sold OCPs other than Mala-D. However, of the 32 pharmacists who were not selling Mala-D, 28 (87.50%) expressed their interest in selling Mala-D. Of the 78 who knew about Mala-D, 48 (61.54%) opined that the practitioners should be motivated to prescribe Mala-D and 20(25.64%) felt that advertisements may help.

Of the 71 pharmacists who were aware of socially marketed ORS, none were selling them. The reason cited was that there are no distributors for socially marketed ORS. All of them sold ORS of other brands which were not socially marketed. Electral, Energal, Walyte and Electribion were most commonly sold brands. However, of the 71 pharmacists, 66 (92.95%) expressed that if socially marketed ORS is distributed to them, they would sell it. All of them opined that advertisements and prescriptions would help.

After interviewing the pharmacists, we interviewed 5 customers who came to that pharmacy, with the inclusion criteria that they were more than 18 years and consented to participate in the study. A total of 510 persons were interviewed using a pre-designed, pre-tested semi-structured questionnaire. Standard of living index was used to assess their socio economic status.

Of the 510 persons, 292 (57.25%) were males, 116 (39.72%) persons belonged to 30-39 years age group, 240 (47.06%) were high school educated and 158 (30.98%) belonged to lower middle socio-economic class (See table 2 for details).

Knowledge about socially marketed condom was higher among males in the age group of 30-39 years, with at least high school education and belonging to upper middle class. However, males aged 20-29 years and lower middle class reported to have ever used socially marketed condoms. Only 59 (27.06%) of females reported use of SM condoms by their partners. The peer encouragement or recommendation for use of condoms seemed to follow the usage pattern closely. (See Table 2 for details)

Knowledge about socially marketed OCPs was higher among females in the age group of 20-29 years, with at least college education and belonging to upper middle class. However, ever used SMP OCPs and peer encouragement or recommendation for use of OCPs patterns seemed to follow the same socio-demographic pattern closely. (See Table 3 for details)

Knowledge about socially marketed ORS was higher among females in the age group of 40-49 years, with at least primary school education and belonging to lower middle class. However, none of the females aged 20-29 years and belonging to socio economic class of rich had ever used ORS. (See Table 4 for details)

The most common reason cited by the users of socially marketed products was, recommendation by health care personnel (167(61.34%)). The other important reasons were easy availability 121 (44.48%), reasonable cost 105 (38.60%), recommendations by peers 6 (24.26%) and advertisements 53 (19.48%). 235 (86.39%) were of the opinion that the quality of the socially marketed products was satisfactory. 140 (51.47%) thought that

the availability of socially marketed products needs to be increased.

Discussion:

Though social marketing of condoms began along with the family planning programs, it gained momentum as an early response to the HIV / AIDS epidemic. The key principle of condom social marketing was that the condoms should be sold at an affordable price using a local adaptable commodity logistics chain.

In a meta-analysis by sweat et al. to study the effectiveness of condom social marketing interventions reported that persons with availability and exposure to condom social marketing were at least twice more likely to use condoms at last sex and overall condom use for any reason was higher for general public, people with high risk behaviour, adolescents and clients of commercial sex workers.

In this regard our study shows that awareness of social marketed condom is only 87.25% and selling of the same was 82.35% among the pharmacist of registered pharmacies. Among the general public, 86.98% of the males and 65.13% of the female were aware of the social marketed condoms, 72.95% males and 27.06% of females had ever used socially marketed condoms and only 65.07% of males and 21.56% of females recommended use of social marketed condoms.

Consistent condom use has been one of the important preventive strategy of NACO's prevention for HIV/AIDS control and objective to make its availability within 15 minutes of walking distance from any location and NACO's main condom promotion strategy is availability and creating demand for condoms and one of the key salient features of the Targeted Condom Social Marketing Programme are ensure availability of subsidized condoms at high priority districts with a specific focus on Deluxe Nirodh (GoI brand) to ensure acceptability [5].

HLL life care limited one of the largest Social Marketing Organization for the Ministry of Health and Family Welfare (MoHFW), ensuring sales of over 70% of the Government of India brands - Deluxe Nirodh and Mala-D nationally, to the vulnerable and high-risk groups of women, under the programme initiated by National Aids Control Organisation[6].

The scheme of social marketing of oral pills was started in 1997 under the brand name of Mala-D, voluntary organizations and social marketing organizations working in the field of health and family welfare are allowed to sell with the other brand name with a fixed price by the marketing organization so that it is less compared to the commercially available oral pill.[7] However, the knowledge, ever use practice and peer recommendation of SM OCPs was higher among females in our study and the findings are similar to the study done by Sonal Sherpa et al. in Udupi district of Karnataka.[8]

Our study reveals that the knowledge and practise patterns reported among females was slightly higher than the average practice reported by studies from different parts of India like Uttarkhand (15.7%), Himachal Pradesh (11.7%), Maharashtra (5.6%), Madhya Pradesh (4.8%) and Tamilnadu (2.3%). [10,11,12,13]

Diarrheal deaths rank 2nd of under-five deaths, oral rehydration salt solution therapy remains the cornerstone of management of diarrhoea.ORS usage rates are still unacceptable, while unwarranted anti-diarrheal drugs and injections continue to be prescribed frequently.8

The knowledge and practice of use of ORS among health care providers and care givers has increased, the sales of ORS increased by 37% in 2006 compared to 2001 (10%) and most selling ORS was Electral (77%) which was not government brand [13, 14].

Conculsion:

The knowledge about socially marketed products among pharmacists was good. Availability pattern of SMPs followed the knowledge, ease of procurement, availability of distributors and customer demand. The attitude of the pharmacists was favourable for SMPs however, increasing publicity by means of advertisements on televisions, use of bill boards were recommended for boosting the SMPs sale. Common reason for not selling of SMPs was non availability of distributors for the particular product. More than three fourth of the pharmacists opined they were satisfied with SMP profit margin and were motivated to continuing the sales of SMPs.

The customer awareness about SMPs was higher for condoms as compared to OCP or ORS. The awareness and usage of condoms and OCPs was

higher in 20-29yrs and 30-39yrs age group respectively. With increasing education the awareness, ever use and recommendation for future use seem to slightly increase however, as socio-economic status increased the usage and peer recommendation of SMPs products seem to decrease.

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Original Research Article

The Association between Psychological Distress and Body Mass Index among Young Adults in Saudi Arabia

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Abstract

Objectives: To evaluate the association between psychological distress and BMI among young adults in Saudi Arabia. **Methods:** A cross-sectional study based on an 18-question self-reported survey on psychological distress was distributed to the students of KSAU-HS, KAU, and intermediate and high school students during the academic year of 2013-2014. According to the level of psychological distress, the participants were divided into three main groups using Kessler K6 scoring system, which is validated by the Australian National health Care Center (Health direct Australia) standards. The three groups are: (High range category K6= 30-20, Moderate range category K6= 19-12, Low range category K6= 11-6). We compared the mean levels of body mass index (BMI) to the three groups of psychological distress. **Results:** There were 722 participants with median age of 20 years, included in the final analysis. The higher BMI participants were associated with high Kessler K6 score; however, this correlation was not statistically significant. The correlation of Kessler K6 score across genders revealed that females have higher Kessler K6 scores than male$(\rho - value < 0.0001)$. In addition, married participants scored statistically significant higher Kessler K6 scores than single$(\rho - value < 0.0001)$. Other correlation of psychological distress with changes in Sleep hours and physical activity was statistically insignificant. **Conclusion:** Although the association between psychological distress and BMI was not statistically significant, there were a positive trending correlation between mean BMI and increasing psychological distress score. On the other hand, there were strongly significant correlations between female gender and married participants to increasing psychological distress.

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Introduction

Young adults (15-29 years old) all over the world face great deal of difficulties in their daily life. This age group contains high school students, college students, and post graduates. Studying textbooks, doing assignments, taking exams, deciding their specialties, leaving home, looking for jobs, and initiating a life careers are some examples of stressors they might face. These stressors are not without negative consequences. The stress experienced by students might affect their general health, which in turn may have a negative impact on their academic performance. This negative impact on health can be exaggerated if associated with obesity (1).

Obesity, which is defined by a Body Mass Index (BMI) is greater or equal to 30 is linked to a wide range of health threatening medical conditions such as cardiovascular diseases, diabetes mellitus, musculoskeletal disorders, and many others (2). Recently, the American Medical Association (AMA) has recognized obesity as a disease by itself that requires medical attention and treatment (Cite).

According to a recent report by the World Health Organization (WHO), in 2014, 13% of adults aged 18 years and over are obese (3). In Saudi Arabia, which is a young nation, 66.89% of the population is under the age of 64 years old and those below 15 years constitute about 30.37% of the total population (4). Obesity in 15 years and younger in our population is one of the highest in the world. It is considered a major concern of health, as obese children becomes obese adults particularly if it was at adolescence (5). In addition, the prevalence of obesity among females is higher than that of males (39.1% - 28.6%) respectively (6).

Many studies have suggested that prolonged stress causes the release of a hormone called cortisol which, causes weight gain and central obesity (7). A study, conducted on law enforcement officers in United States, showed a strong positive correlation between psychological distress and obesity defined by BMI (8). Psychological distress is the fifth leading cause of disability in Saudi Arabia (9).

Our study will discuss the stress level variation between males and females in our local population. Typically, males in Saudi Arabia endure most of the financial burdens associated with marriage even if the wife is working according to the Islamic teaching. This stressor will be added as an addition to the stress that is usually concomitant with marriage. On the other hand, females have to overcome their own set of difficulties. The conservative nature of the Saudi society may influence the idea of female dependence on their male chaperons. A prominent example are transportation-related issues, in which females need to be dependent on their chaperons or private drivers for transportation (10).

In general, the social stigma associated with mental disorders could prevent people from reporting psychological symptoms or even seeking help when needed. This may explain the shortage of psychological health studies info from Saudi Arabia and the estimated high prevalence of sub clinical psychological cases.

This paper will assess the association between psychological distress and BMI in individuals who responded to the study questioner over eight-week period. This particular association is an issue that has never been studied in our population. However, the increasing rate of incidence and prevalence of obesity in Saudi Arabia is might be associated with increasing socioeconomic status of the country for the last 30 years, predicting a worsen situation in the nearby future (11). In addition, this study aims to spread the awareness about the mental health and its relationship with obesity, the importance of seeking help, and eradicating the social stigma associated with mental disorders.

Methods:

This is a cross-sectional study based on an 18 questions survey (attached in the appendices **A1 with participation consent form A2)** The data for this study was obtained from a self-reported questionnaire that was distributed to the students. The study includes all students (722 participants) of KSAU-HS, KAU, intermediate and high school students who received a hard copy of the questionnaire and agreed to participate voluntarily in this study. They were asked to fill it out during the lecture time, subsequently hand it back to the research team through their representatives. In addition, an electronic form of the same questionnaire was designed using SurveyMonkey (an electronic platform for designing and collecting data via surveys). The link of the survey was distributed using Twitter aiming for graduate and post-graduate students. Through the SurveyMonkey platform, the data was automatically added and stored in a downloadable spreadsheet. This study focuses mainly on the association between the BMI and Psychological distress. However, we took into consideration the effects of other covariates, which will be discussed below. Moreover, the participants were asked to answer a 6 questions based on Kessler K6 criteria in order to assess the level of psychological distress. This study is approved by the Research Office of the college of medicine at King

Saud bin Abdulaziz University for Health Sciences (KSAU-HS).

BMI as an Outcome Variable:

In this study BMI is used as a parameter to indicate obesity as an outcome variable. In order to calculate BMI, the subjects were asked to provide their height in centimeters (cm) and weight in kilograms (kg). Then we divided the weight in kg by the corresponding height in meters squared ($\frac{Kg}{m^2}$). According to the BMI result, the participants will be put into three categories (BMI < 24.99 kg/m^2 for underweight/normal, BMI 25-29.99 kg/m^2 for overweight, BMI ≥ 30 kg/m^2 for obese).

Psychological Distress as an Exposure Variable:

In this study Kessler K6 criteria is used to indicate psychological distress levels as an exposure variable. The Kessler K6 criterion has been widely used with approved validity as a screening method for psychological distress to assess the presence of a severe mental health disorder (12). The participants were asked to answer six key questions. Every question has five possible answers. The Kessler K6 criteria composed of the following six question: "during the last 30 days, how often do you feel (anxious, desperate, bored, very depressed that nothing cheer you up, require an effort to do something, you have no value). The answers categories based on the Australian National health Care Center (Health direct Australia) standards are: [always (score: 5), often (score: 4), some of the time (score: 3), rarely (score: 2), never (score: 1)] with a possible total score range from 6 to 30 point (13). According to the result the participants were categorized into three psychological distress groups: (High range category K6= 30-20, Moderate range category K6= 19-12, Low range category K6= 11-6). People in the high/moderate range categories are more likely to develop severe mental health disorders and need medical care. People in the low range category are usually considered in well mental status and they may benefit from the test to assist early intervention and further protective actions.

Covariates:

In this study we have also assisted the impact of stress-related covariates, which have been associated with increased psychological distress. The covariates included in this study are age, gender (male/female), marital status (single/ married), educational status (student/ graduate employed/ graduate unemployed), educational level (school student/ college student), the presence of chronic illness (presence), smoking (presence, amount, frequency), previous mental disorders (presence), sleeping hours (deprivation/ increment), and physical activity (presence and duration).

Data Management and Analysis Plan:

In order to process the data we used simple descriptive statistic. To explore our data, mean and stander deviation (S.D) were used to represent for normally distributed continuous variables, median and quartiles for skewed data. All proportions were represented in percentages. The comparison between two means was done using two independent sample *t*-tests. A chi-square test (x^2) for comparison between groups with $\rho - value < 0.05$ was considered significant.

Ethical considerations: Ethical committee approval is attached in appendices A3

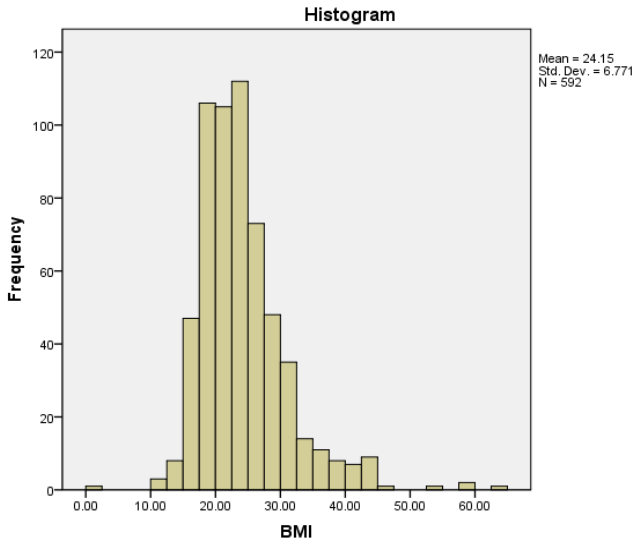
Results:

Demographic data

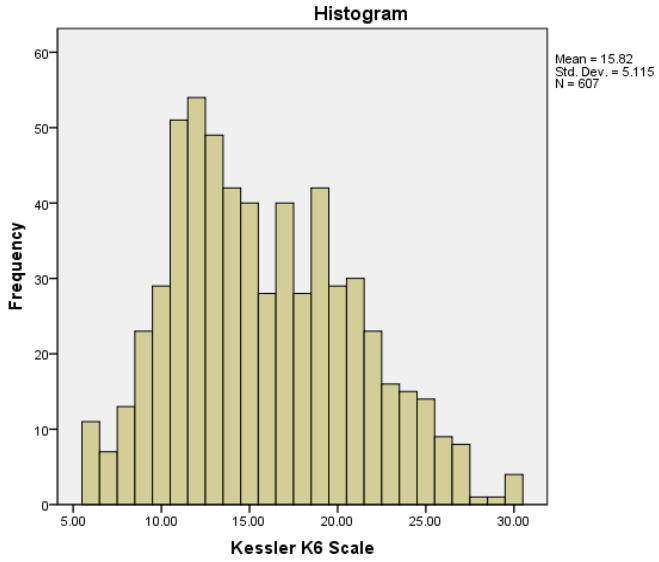
Our sample was 722 participants. Their median age was: 20 year-old (minimum: 14, maximum: 57, IQT: 6) and 51.2% of them were females (n=370). 71.1% of our sample were from Jeddah, 13.4% were from Makkah, 7% were from Riyadh, 2% were from Madinah, and the rest were from all over the country. 20.9% of them were married. In terms of the employment status: 78.2% of the sample was students, 11% were employed, and 10.8% were unemployed. College students constituted 47.17% of the total population (n=334). In terms of the co-morbidities, 15% of them were suffering from different co-morbidities (atopy: 6.5%, asthma: 5.1%, diabetes: 2%, hypothyroidism: 1%). In our sample, the smoking prevalence was about 6.8%. The BMI mean was 24.2 with S.D: 6.77, and the Kessler K6 score mean was 15.8 with S.D: 5.11. Regarding the number of hours slept per day: 56% of the sample sleep between 6 and 8 hours, 24.3% sleep more than 8 hours, 19.7% sleep less than 6 hours. In terms of the physical activity done per week, our sample had a median of 3 hours per week. 22% of them have

less than one hour per week of physical activity and 20.7% have one to two hours per week of physical activity. The frequency of distribution of Kessler k6 scores and BMI scores is visualized in graph no. 1 and no. 2, as seen in our population. In the following correlational analysis only significant results were presented with a $\rho - value$.

Graph 1: The Frequency of distribution of BMI scores as Seen in our population



Graph 2: The Frequency of Distribution of Kessler K6 Scores As Seen In Our Population



Correlation studies

Correlation between BMI and the Kessler K6 Score:

There is a positive correlation between BMI and Kessler K6 score; higher BMI participants have high Kessler K6 score. However, this correlation was not statistically significant. The correlation can be visualized in graph No.3.

Correlation between Number of Hours Slept per Day and Kessler K6 Score:

When comparing the number of hours slept per day to the Kessler K6 score, there was no statistically significant difference in their mean score.

Correlation between Physical Activity and Kessler K6 Score:

A comparison between physical activity represented by number of exercise hours per week and Kessler K6 score showed no significant statistical correlation between them.

Correlation between the presence of Co-morbidities and BMI:

In a subgroup analysis that focused on the participants with co-morbidities (n=103) in correlation to their BMI, a statistically significant higher BMI values were linked to the presence of a co-morbid status$(\rho - value < 0.002)$.

Correlation between Gender and BMI:

When comparing our female participant (n=367) to males (n=328) in regard to their BMI results, no statistical variance significance was found.

Correlation between Gender and Kessler K6 Score:

When comparing the Kessler K6 score between males and females using independent sample t-test, there was statistically significant higher Kessler K6 score in female participants than males $(\rho - value < 0.0001)$.

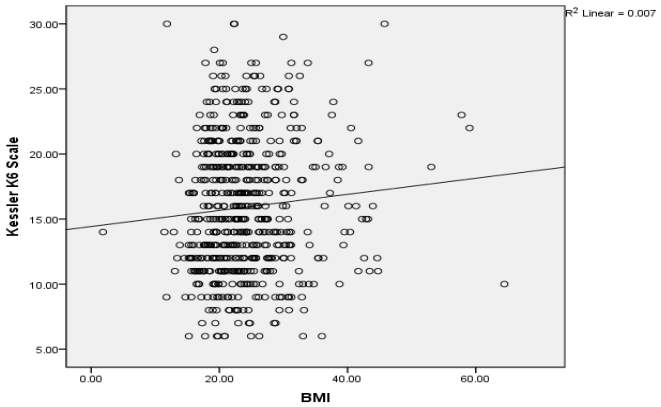
Correlation between Marital Status and Kessler K6 Score:

When comparing the Kessler K6 score between married and single participants using independent sample t-test, there were statistically significant higher Kessler K6 score in married participants than singles $(\rho - value < 0.0001)$.

Correlation between Educational level and Kessler K6 Score:

In subgroup analysis based on the educational level, we found the college students have prominent higher Kessler K6 scores than others with a $(\rho - value < 0.0001)$.

Graph 3: The Correlation between BMI and Psychological Distress (Kessler K6 Scores) as depicted by scatter plotting.



Discussion:

This study investigates the presence of a positive correlation between increasing BMI and increasing psychological distress in a section of students ranging from middle school to college graduates. Our analysis revealed the presence of a positive trend between higher BMI results across participants and higher levels of psychological distress (higher Kessler K6 score). however, this correlation was not statistically significant. An analysis of the associated covariates revealed a positive association of increasing psychological distress with the female gender along with married participants. Other correlation of psychological distress with changes in Sleep hours and physical activity was statistically insignificant.

Many previous studies have explored this relationship in different populations and came up with different conclusions. One study was conducted on law enforcement officers in the United States of America, showed a positive relationship between BMI and Psychological distress with prominent statistical significance in females using the Kessler K6 scoring system (8). Another literature review that investigated the association between workload and body weight showed no support of any association (14). However, there were no studies that investigated this association before in students. This group was of an interest to us because we believe that students face many stressors. The stress experienced by students might affect their general health and academic performance especially if associated with obesity (1).

In our study, higher BMI was associated with higher level of psychological distress represented by the Kessler K6 scoring system. However, this affiliation was not statistically significant. In a subgroup analysis studied only patients with chronic morbidities, the correlation was positive and of a strong statistical significance. In these patients, chronic diseases act as continuous internal stress source leading to repetitive sympathetic system activation thus increased glucocorticoids excess. Which in turn will influence obesity and increased food uptake by inhibiting leptin hormone (Satiety hormone) and activation of neuropeptide Y (NPY) (15). Furthermore, in a subgroup analysis that focused on current university students showed a strong statistical significance. This might be due to the wide range of participants' age. The inclusion of intermediate and high school students, who may have lower stress levels might have caused the analysis to drive toward the null (no association).

Regardless of the BMI the female gender was strongly linked with higher level of psychological distress (higher Kessler K6 score) than their male counterpart. Higher level of distress in Saudi female students might be due to social restrictions in the conservative Saudi society. The Saudi society is a family oriented community were the eldest male members play the main role in making the family decisions and deciding their fate. Dr. Elamin found that older, employed, married, and less educated males have more traditional views toward females. The traditional view is concerned with the idea that females are ought not to participate in the higher education and daily working live and assume more home-oriented roles (16). However, these external social factors were not present in other studies from the United States that showed the same trend of increasing distress in females, which may suggest a psychological and biological variation in females perception of stressors despite the various social stressors present in a particular community (17).

Psychological distress can promote weight gain through different means such as unhealthy stress coping mechanism, bad life behaviour, and lack of

physical activities. Normally individuals when facing a stressful situation will alter their diet in terms of quality and quantity (18). Some will substitute healthy diet choices to unhealthy high sugar high fat diet. While others will increase their food consumption which in turn will reflex on a progressive weight gain and higher BMI (19).

In addition, our analysis explored the effect of sleep on the psychological status. Dr. Leproult found that decreased hours of sleep led to an increase in the level of cortisol by 45% in the second day. Which can be translated as increased body stress (20). In our analysis we found no statistical significance between hours slept per day and Kessler K6 score across the three categories of sleep. Taking into consideration the young population included in this study, Dr. Terman found that young adolescent bodies were able to compensate efficiently to the loss of sleep without a significant drop in body and mind performance (21).

The significant association between marital status and increasing psychological distress as seen in our analysis can be explained by the increased social and financial responsibilities associated with marriage especially in young couples (22).

Limitations and strengths

This paper might be associated with some drawbacks that could have an impact on the results. First of all, this study was based on a self-reported questionnaire were recall bias might be involved. Such bias may take effect through overestimation of the height or underestimation of the weight especially in females. However, this bias might be the cause that has driven the analysis against the hypothesis of the study (toward the null). The cross sectional design has many limitation of its own. First, it explores the data in a "one point in time" which might not reflect the causality, efficacy, and temporal sequence opposed by the study variables. Moreover, the individual stressor exposure was not reflected by the questionnaire, which will need a specific interview that is not applicable to this study. In addition, this study didn't investigate the effect stimulants like alcohol and caffeine on the level of the stress, which call for a subsequent investigation.

On the other hand, this study is one of the earliest that focuses on students from a psychological point of view in respect to obesity in our community. It also addresses the changes that manifest across different educational levels. We also explored the effect of marriage and its burden in this age group unlike other studies that explored this correlation.

Conclusion / Recommendations:

In Summary, an increased psychological distress showed positive correlation to the BMI without a prominent statistical significance. The positive association was greatly influenced by the gender, were females showed higher prevalence of psychological distress and stronger correlation in comparison to the males. Subgroup analyses showed that being married, college student, or having non-communicable chronic co-morbidities increases your risk of having a higher psychological distress. This article shed light on the significance of different variables on the psychological well-being of an individual and encourages further research to explore the longitudinal effects of the positively associated factors on the younger population for a physically and mentally healthier and more productive society.

Conflict Of interest

No potential conflict of interest relevant to this article was reported. The findings and conclusions in this report are those of the authors.

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Survey Form	A1

Participation form in a Scientific Research

Research Title: The Association between Psychological Distress and Body Mass Index among Young Adults in Saudi Arabia

Main Objective: To evaluate the association between psychological distress and BMI among young adults in Saudi Arabia.

Research Team members:

Abdullah Abdulsalam Ghouth Ali	5th yr. Medical Student	Principal Investigator / KSAU-HS, Jeddah, Saudi Arabia
Mohammad Adil Zwawy	5th yr. Medical Student	KSAU-HS, Jeddah, Saudi Arabia
Abdulaziz Tamim Al- Zauir	5th yr. Medical Student	KAU, Jeddah, Saudi Arabia
Dr. Ahmad Al-Saleh	Assistant professor of psychiatry and consultant, College of Medicine, King Saud Bin Abdulaziz University for Health Sciences, Jeddah, Kingdom of Saudi Arabia	
Dr. Basim Alsaywid	Assistant professor, Urologist, and Epidemiologist, College of Medicine, King Saud Bin Abdulaziz University for Health Sciences, Jeddah, Kingdom of Saudi Arabia	

Please give us a few minutes to answer the following questions, all your answers remain confidential.

General Information

Gender: ☐ Male ☐ Female

City: Age: years

Nationality:

Marital Status: ☐Married ☐ Single

Occupational Status: ☐Currently Employed

☐Currently Unemployed

☐Student

If student, please specify: ☐ High School Student

☐ College student

If college student, please specify which years: ☐ 1 ☐2 ☐3 ☐ 4 ☐ O----------

If you are college student, name your major

☐Medical specialties (Specialty:----------)

☐Engineering Specialties (Specialty:----------)

☐Science specialties (Specialty:----------)

☐Literature Specialties (Specialty:----------)

Monthly Income

Do you depend on yourself in income?

☐ NO ☐ Yes, please mention average income: (----------)

Survey Form	A1

Medical Information

Length: ☐ cm Weight: ☐ kg

Do you have any chronic medical condition?

☐ NO ☐ Yes, please mention (----------)

Do you smoke cigarettes?

☐ NO ☐ Yes

If Yes, please state the following:

1. Number of cigarettes per day: (---------- cigarettes/day)
2. You started smoking at the age of (----------years)

Have you been diagnosed with a mental disease before?

☐ NO ☐ Yes, please mention (----------)

The following questions ask about how you have been feeling during the past 30 days. For each question, please circle the number that best describes how often you had this feeling.

During the past 30 days, about how often did you feel …

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
1. Nervous	5	4	3	2	1
2. Hopeless	5	4	3	2	1
3. Restless or fidgety	5	4	3	2	1
4. Very depressed that nothing cheers you	5	4	3	2	1
5. Everything was an effort	5	4	3	2	1
6. Worthless	5	4	3	2	1

How many hours do sleep a day?

☐ More than 8 hours/ day ☐ 6-8 hours/ day ☐ Less than 6 hours/ day

Do you have a physical exercise routine in a week?

☐ NO ☐ Yes

If Yes, please estimate how many hours per week: (----------Hours/week)

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Original Research Article

Profile of Patients Attending a District Level Cancer Hospital – A Cross-Sectional Study

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Date of Submission: 18.02.2016 **Date of Acceptance: 02.05.2016**

Abstract

Introduction: Cancer has become one of the ten leading causes of death in India. It is estimated that there are nearly 2 -2.5 million cancer cases at any point of time. Cancers of oral cavity and lungs in males and cervix and breast in females account for over 50%of all cancer deaths in India. **Objectives:** 1.To study the socio-demographic profile of patients attending a district level cancer hospital. 2. To study the pattern of cancers in male and female study subjects and their risk factors. **Material & Methods:** A cross-sectional hospital based study was conducted between October2014 –December2014 among 125 patients attending a district level cancer hospital, who were diagnosed and were undergoing treatment for different types of cancers. A pre-designed, semi-structured questionnaire was administered and details regarding their socio-demographic profile, exposure to risk factors, types of cancers, staging and treatment modalities were recorded. Data was entered and analysed using SPSS software21.0 version. Proportions and chi-square calculated to study the different study variables. **Results:** Out of the125 study subjects, 76.8% were females and 23.2% were males. 60.8% of the study subjects were in the age group of 41-60 years followed by 20.8% in the 6 1-80 years age group. In males, the leading cause of cancer was stomach (24%) and in the females54% suffered from breast cancer**.**

Key words: Cancer, Risk Factors, Stages of Cancer, Nellore

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Introduction

Cancer may be regarded as a group of diseases characterized by an abnormal growth of cells, ability to invade adjacent tissue and even distant organs and the eventual death of the affected patient if the tumour has progressed beyond that stage when it can be successfully removed. Globally, cancers in all forms are causing about 12% of all deaths. In developed countries cancer is the second leading cause of death accounting for 21% of mortality by other causes and in developing countries it ranks third, accounting for 9.5% of all deaths.[1] In 2012, worldwide burden of cancer rose to an estimated14 million new cases and 8.2 million deaths due to cancer per year. Globally, during 2012, the most common cancers diagnosed were those of lung, breast and colorectal and the most common cancer deaths were cancer of the lung, liver and stomach.[2] Non-communicable diseases including cancer are emerging as major public

health problems in India. Cancer has become one of the ten leading causes of death in India. It is estimated that there are nearly 2 -2.5 million cancer cases at any point of time. Over 8 – 9 lakh new cases and 4 lakh deaths occur annually due to cancer.[3] Nearly15 lakh patients require facilities for diagnosis, treatment and follow up at a given time.[1] Cancers of oral cavity and lungs in males and cervix and breast in females account for over 50%of all cancer deaths in India. Report of National Cancer Registries and Atlas of Cancer in India says that one in about 15 men and one in about 12 women in urban areas could develop cancer in their life time. Breast cancer and cervical cancers are commonest among females and cancer lung is commonest out of all tobacco related cancers in men. The important risk factors for cancer deaths in 34 – 64 years are related with tobacco, alcohol, diet, reproductive sexual behaviour, occupation, pollution, industrial products, medicines, geophysical factors etc .[3]

Objectives

To study the socio demographic profile of the patients attending the district level cancer hospital.

To study the pattern of cancers in male and female study subjects and their risk factors.

Material & Methods

A cross-sectional hospital based descriptive study was conducted among the patients attending a district level cancer hospital. It was done between September 2015-November 2015 among the patients who were diagnosed and were undergoing treatment for different types of cancers. Thus a total of 125 patients were recruited into the study after taking their consent. A pre-designed, semi-structured questionnaire was administered and details regarding their socio-demographic profile, exposure to risk factors, types of cancers, staging and treatment modalities were recorded. Data was entered and analysed using SPSS software21.0 version. Proportions were calculated for the different study variables.

Results

The present study was conducted on 125 study subjects attending the District level Cancer Hospital. Out of them, 76.8% (96) were females and 23.2% (29) were males. 60.8% (76)of the study subjects were in the age group of 41-60 years followed by 20.8% (26) in the 61-80 years age group.40% of the study subjects were illiterates and only 6.4% were educated above high school level.63.2% were unemployed and 24% constituted unskilled workers.98% of the study subjects were married and 92% were from nuclear families. Hindus constituted 85.6% of the study population followed by Muslims (8%). 44.8% belonged to backward classes, 34.4% were from open category and 20% from scheduled caste.68% of the study subjects belonged to upper middle and middle class and 20% constituted upper class according to B.G.Prasad's classification of socio-economic status. 91% of the study subjects were taking mixed diet and among them 70% took non-vegetarian food once a week where as 17% took twice a week.

Table 1: Sex wise distribution of smoker and alcoholic cancer patients

Variable	Male N= 29 (%)	Female N = 96 (%)	Total N = 125 (%)
Smoking	24 (83)	0 (0)	24 (19.2)
Alcohol	23 (79)	0 (0)	23 (18.4)
Smokeless tobacco	01 (3.4)	27 (28)	28 (22.4)

Table: 2 Staging of Cancers (n=125)

Staging	Frequency	Percent
I	11	8.8
II	75	60.0
III	26	20.8
IV	13	10.4
Total	125	100

Among the male study subjects 83% were smokers and 79% were alcoholics. None of the female subjects were smokers or alcoholics, but 28% were using other forms of tobacco (Table:1) Among the females, 72% were in the 16- 19 year age group when they were married and 17% in 20-24 year age

Fig: 1- Pattern of cancers among the male study subjects (n=29)

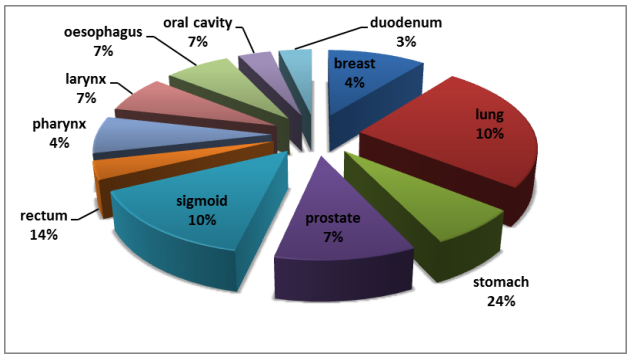


Fig: 2 – Five leading causes of cancer among female study subjects (n=96)

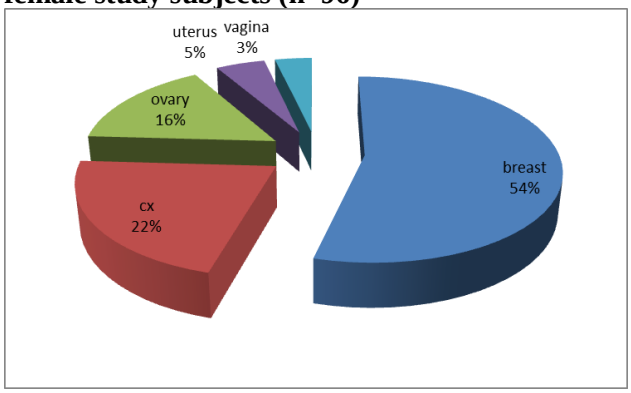
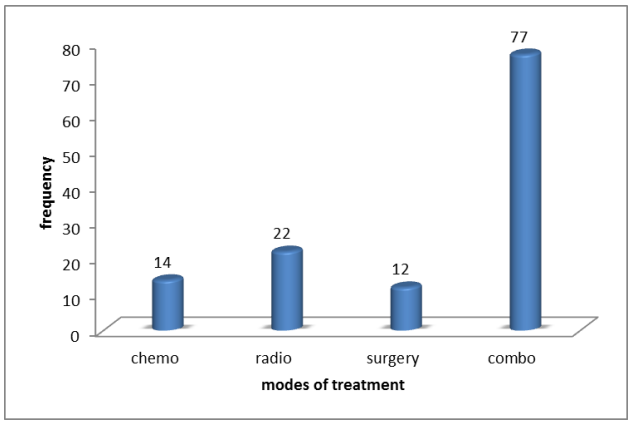


Fig: 3 – Different modes of cancer treatment



group. 26% of the women had 2 children and 57% of them had 3 or more children. In males, the leading cause of cancer was stomach (24%), followed by rectum (14%) (Fig: 1). Among the females 54% suffered from breast cancer (Fig: 2). 60% of the cancers were in Stage II followed by stage III (20.8%) (Table: 2). 77% of the cancers were treated through a combination of therapies (Fig: 3)

Discussion

In the present study among 125 subjects 76.8% were females and 23.2% were males. 60.8% of the study subjects were in the age group of 41-60 years followed by 20.8% in the 61-80 years age group. In a study by Puri. Ishat et.al[1] 684 patients constituted the study sample, with 359 (52.5%) females and most (32.3%) patients were in the age group 60- 69 years. In another study conducted by a tertiary hospital in western Maharashtra[4], the study sample consisted of 96 (46.8%) males and 109 (53.2%) females. Most (71, 34.6%) of the patients were in the age group of > 60 years followed by 24.3% in the age group of 51-60 years. A similar study done by Giri PA et al[5] revealed that, out of the 207 cancer patients, 41.54% were in the age group of >60 years, followed by 30.43% in the age group of 50-60 years. Studies by Rajarao P et al[6],Khandekar SP et al[7] and Ganesh R et al[8] also found that majority of the subjects belonged to 51 - 60 years age group.

In the present study Hindus constituted 85.6% of the study population followed by Muslims(8%).Hindu patients were maximum (63.3%),followed by Sikhs and Muslims in the study done by Puri et.al[1]. , A study done by Pravara Institute of Medical Sciences[4], Loni, Maharashtra, showed 90.7% of the patients belonged to Hindu religion, followed by Muslims (7.3%).

In our study 40% of the study subjects were illiterates followed by those who had primary schooling (18%) and only 6.4% were educated above high school level. Similar result was seen in the study by Puri et.al[1]. Another study done at Loni, Maharashtra[4] showed that majority of patients (59.0%) were illiterate, and only about 2% were graduates. A similar study done by Giri PA et al[5] indicated that 30.91% were illiterates and only 12.07% were graduates. 68% of the present study subjects belonged to upper middle and middle class and 20% constituted upper class according to B.G.Prasad's classification of socio-economic status. Studies done by Khandekar SP et al[7] and Ganesh R et al[8] also found that majority of the

subject are from lower middle and upper lower socio-economic status.

In the present study, among the male study subjects 83% were smokers and 79% were alcoholics. None of the female subjects were smokers or alcoholics, but 28% were using other forms of tobacco. In a study done at Loni, Maharashtra[4], most of the patients (47.7%) gave a history of tobacco chewing followed by 42.1% smoking (either cigarette, bidi, or both) and 35.1% betel nut chewing, while 20.4% had a history of alcohol consumption. Similar findings were evident in research done by Giri PA et al[5], Puri S et al[1,] and Murthy NS et al[9,] which too showed that the major risk factors for all cancer patients were tobacco, smoking, habits of betel nut chewing, alcohol consumption, and dietary habits. Another study of Trivandrum too had emphasized that smoking increased the risk of oral cancer in men by as much as 90%.[10] Relation of alcohol and cancer has been well established in many studies. A new global study by Cancela *et al.* has shown that people who consume large quantities of alcohol (seven drinks per week) have a 60 per cent greater risk of developing the cancer, compared to others.[11] Various studies have substantiated enough evidence that alcoholism is associated with varied cancers like oral cavity, oesophagus, liver, pancreas, colon and rectal cancer substantiated in many studies.

In the present study, 54% females suffered from breast cancer followed by cervix (22%) and ovary (14%). In males, the leading cause of cancer was stomach (24%), followed by rectum and sigmoid colon (14%). A study done by Bagchi S[12] depicted that breast cancer epidemic would occur over the next decade as more women adopt Western lifestyles by marrying and bearing children later in life.

Recommendations: In the present study, it is seen that only 8% of the patients came to the hospital in the 1st stage of disease and almost a third presented themselves in the 3rd and 4th stages of the disease. Awareness should be brought about in the general public regarding the danger signs of cancer, how to recognize them early and also educate them how to utilize health services effectively. Health education should also be imparted to the public regarding the risk factors of cancers such as smoking, alcoholism, spicy and fatty diet etc., and encourage them to adopt healthy life styles. School and college going students should be the prime targets as this is age when they develop different habits.

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Original Research Article

Epidemiology of Orthopedic Injuries among Patients Attending a Major Trauma Centre in Tamilnadu

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Date of Submission: 13.03.2016 **Date of Acceptance: 06.05.2016**

Abstract

Background: Deaths due to injury are growing fast and doubling every sixth year in India. In India due to demographic transition, urbanization and industrialization injuries will become one of the major contributors of the total diseases burden by the years 2020. **Objectives:** to study the epidemiology of orthopedic injuries among the patients attending a major trauma centre in Tamilnadu. **Methods:** A retrospective study was carried out among 2368 patients who have attended with the history of accident/ injury to the orthopedic outpatients and inpatient department in a government tertiary care hospital in Tamil Nadu. **Results:** Majority of the injured were males (73.2%). The most common age group with complaints of injury was 20-39 age group (42.4%) followed by 40-59 age group (31.2%). common mode of injury was road traffic accidents (42%), followed by self sustained injury (36%) and assault (21.3%). Limb injuries were commonest orthopedic injury. **Conclusion:** The knowledge on the modes and types of injury will help the policy makers to draft prevention policies. As the road traffic accidents being the commonest mode of injuries our strategy in creating awareness on road safety among the public has to be improved and intensive test on the knowledge of road safety before giving license to drive in India has to be made more stringent.

Key words: epidemiology, orthopedic injuries, mode of injuries, type of injuries

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INTRODUCTION

More than 5 million people die each year as a result of injuries account for 9% of the world's deaths. Among the causes of injury are acts of violence against others or oneself, road traffic crashes, burns, drowning, falls, and poisonings. Injuries and violence have been neglected from the global health agenda for many years, despite being predictable and largely preventable.[1] Injuries represents global health problem particularly in the low and middle income countries. Road traffic injuries are a development issue: low- and middle-income countries lose approximately 3% of GDP as a result of road traffic crashes.[2] Deaths due to injury are growing fast and doubling every sixth year in India. In India due to demographic transition, urbanization and industrialization injuries will become one of the major contributor of the total diseases burden by the years 2020.[3] Even though India is undergoing an epidemiological transition with these injuries accounting for a major proportion of disease burden the available information related to injuries were poor.[4] Data on the injuries will help to provide information to develop strategies in injury prevention and implement public health community intervention programmes in India. This study was undertaken to study the epidemiology of orthopedic

injuries among the patients attending a major trauma centre in Tamilnadu.

METHODOLOGY

A retrospective study was carried out among 2368 patients who have attended with the history of accident/ injury to the orthopedic outpatients and inpatient department in a government tertiary care hospital in Tamil Nadu for a period of 6 month from July to December 2015. The information was collected on mode of injury and type of injuries among males, females and across all age group from the hospital record records. The institutional ethical review board approved the study Data were entered on Microsoft Excel spread sheet. The data were analyzed using standard statistical software packages. Descriptive data were presented as percentages and unadjusted odds ratios (OR) to measure the strength of association and 95% confidence intervals (CI) were calculated. Chi-square test was used to lend statistical support to prove associations between categorical variables

RESULTS

Table 1 depicts age and sex distribution of the 2368 patients either attended or referred to orthopedic departments. Majority of the injured were males 1734(73.2%). The most common age group with complaints of injury was 20-39 age group (996, 42.4%) followed by 40-59 age group (738, 31.2%).
Figure 1. depicts mode of injury and sex distribution. The road traffic accidents (43.8%) and bull gore injury (2%) was more common among males compared to females. Injury due to assault (23.5%), self sustained injury (38.4%) and train traffic accidents (8%) were more common among females compared to females.

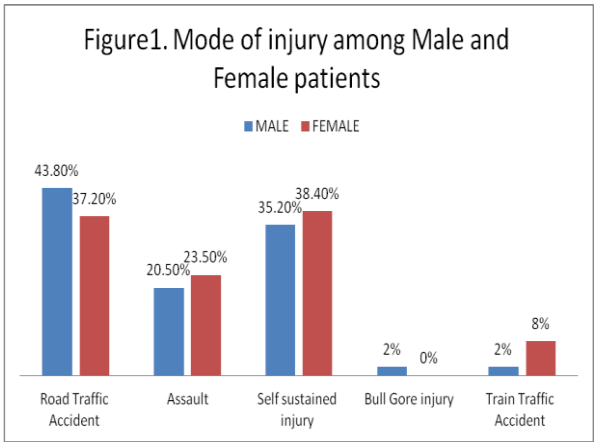

Table 2 shows the mode of injury with road traffic injury being the commonest mode of injury with 996(42.1%) patient followed by self sustained injury 854(36.1%) and assault injury505 (21.3%). The road traffic accident was more common in the age group of 20-39 years (453, 45.5%) followed by 40-59 years (303, 30.4%). Injury assault was common in the age group of 20-39 years (230, 45.5%) followed by 40-59 years (182, 36.0%). In the same way self sustained injury, bull gore and train traffic accidents were common in the age group of 20-39 years compared to other age groups. Odds ratio for

Table1. Age and Sex distribution of patients attending orthopedic department

Age group (years)	Male	Female	Total
<19	215 (12.4%)	56 (8.8%)	272 (11.4%)
20-39	806 (46.5%)	197 (31.1%)	996 (42.4%)
40-59	498 (28.7%)	241 (38.0%)	738 (31.2%)
>60	215 (12.4%)	140 (22.1%)	355 (15.0%)
Total	1734 (73.2%)	634 (26.8%0	2368 (100%)

road traffic accidents (OR=1.5, 95% CI=1.1-1.9) and assault (OR = 2.2, 95% CI= 1.5-3.2) were significantly higher among the age group 20-39 and it was found statistically significant ($p<0.05$)). The risk of self sustained injury was less among the patients above the age 19 years compared age group of less than 19 years and it was found statistically significant ($p<0.05$).

Table 3. Shows the pattern of injury. Majority of them had soft tissue injury (1248, 52.7%) followed by lower limb (425, 18%) and upper limb fracture (405, 17.1%). The proportion of soft tissue injury, lower limb fracture, joint dislocation and multiple fractures were higher in males compared to females. In case of females the proportion of upper limb fractures and spinal cord injury were higher in females compared to males.
Table 4 shows age distribution and type of injury. Soft tissue injury and multiple fractures were more

Table 2. Age distribution and mode of injury of the patients attending orthopedic department

Mode of injury	<`19 yrs	20-39 yrs	40-59 yrs	60 and above	Total
Road Traffic Accident OR (95% CI)	96 (9.7%) 1	453(45.5%) 1.5(1.1-1.9)*	303 (30.4%) 1.28(0.9-1.7)	144 (14.5%) 1.2(0.9-1.7)	996 42.1%
Assault OR (95% CI)	33 (6.5%) 1	230 (45.5%) 2.2(1.5-3.2)*	182 (36.0%) 2.4 (1.6-3.5)*	60 (11.9%) 1.5(0.9-2.3)	505 21.3%
Self sustained injury OR (95%CI)	141 (16.5%) 1	314 (36.8%) 0.4(0.3-0.5)*	250 (29.3%) 0.5(0.4-0.6)*	149 (17.4%) 0.6 (0.5-0.9)*	854 36.1%
Bull gore injury	0	3 75.0%	1 25.0%	0	4 2%
Train traffic accident OR (95%CI)	1 (11.1%) 1	3 (33.3%) 0.8(0.1-7.8)	3 (33.3%) 1.1(0.1-10.7)	2 (22.2%) 1.5 (0.1-17.0)	9 4%
Total	272 11.4%	1003 42.4%	737 31.2%	355 15.0%	2368 100%

*P value <0.05

Table3. Sex distribution and type of injury among patients attending orthopedic department

Type Of Injury	Male	Female	Total
Soft tissue injury	927 (53.4%)	321 (50.7%)	1248 (52.7%)
Upper limb fracture	264 (15.3%)	141 (22.3%)	405 (17.1%)
Lower limb fracture	330 (19.1%)	95 (15.0%)	425 (18.0%)
Pelvic injury	20 (1.2%)	8 (1.3%)	28 (1.2%)
Spinal cord injury	30 (1.7%)	12 (1.9%)	42 (1.8%)
Joint dislocation	28 (1.6%)	8 (1.3%)	36 (1.5%)
Multiple fracture	136 (7.9%)	48 (7.6%)	184 (7.8%)
Total	1734 (73.2%)	634 (26.8%)	2368 (100.0%)

Table4. Age distribution and type of injury among patients attending orthopedic department

TYPE OF INJURY	<19 yrs	20-39 yrs	40-59 yrs	60 yrs and above	Total
Soft tissue injury	128 (47.0%)	567 (56.5%)	399 (54.1%)	153 (43.1%)	1248 (52.7%)
Upper limb fracture	70 (25.9%)	146 (14.6%)	115 (15.6%)	74 (20.8%)	405 (17.1%)
Lower limb fracture	39 (14.4%)	160 (16.0%)	139 (18.9%)	87 (24.5%)	425 (18.0%)
Pelvic injury	3 (1.1%)	12 (1.2%)	4 (.5%)	9 (2.5%)	28 (1.2%)
Spinal cord injury	3 (1.1%)	17 (1.7%)	13 (1.8%)	9 (2.5%)	42 (1.8%)
Joint dislocation	8 (1.1%)	14 (1.2%)	10 (5%)	4 (2.5%)	36 (1.2%)
Multiple fracture	21 (7.7%)	87 (8.7%)	57 (7.8%)	19 (5.4%)	184 (7.8%)
Total	272 (11.4%)	1003 (42.4%)	737 (31.1%)	355 (15.0%)	2368 (100.0%)

common in 20-39 age group compared to other age group. Upper limb injury was higher in less than 19 years age group. Lower limb fractures, pelvic injury and spinal cord injury were more common among 60 years and above age group. Joint dislocation was more common in the age group of 40- 59.

DISCUSSION

In the present study among 2368 patients attending the orthopedic department with history two third of them (73%) were males and the injury was more common (42%) in the age group of 20-39 compared to other age group. Similar finding was reported by Devarshi Rastogi et al reported injuries were predominantly occurred in the age group of 15-30 and injuries were six times more common among males compared to females.[5] M Swarnkar et al reported nearly half of the injured patients were males and 64% of them were in the age group of 11-40 years.[6] Shriram V. et al had reported in his rural population based study that the injuries were common among males compared to females and the age group commonly affected (42.7%) were age group of 15-59 years.[7]

Road traffic accident

In the present study the most common mode of injury was road traffic accidents (42%) among the patients attending the orthopedic department and it was more common in males(43.8%) compared to females and in the age group of 20-39 years (45.5%) compared to other age group. Similar finding was reported by G. Gururaj et al with road traffic accidents contributing to 52% of total hospital injury registrations and majority of victims of road traffic injuries are men with a ratio of 4: 1 to females and commonly affected age group was 15–44 years.[8] Amitabh Singh, et al reported a male predominant (74%) among patients admitted with head injury the most common mode of injury was road traffic accidents (47%), 21-40 years (40.0%) was most commonly affected age group. [9] Other studies also shows injuries occurred in more productive age group and they are more with sex distribution was heavily skewed towards males. [10,11]

Self sustained injury

In the present study next to road traffic accident, self sustained injury was more common mode of injury with 36.1% of them reporting to orthopedic department. Similar findings were reported by other investigators where self sustained injury as the common cause of injury ranging from 31%-38%.[6,12] In our study self sustained injury was more common females (38.4%) compared to males. The age group commonly affected was 20-39 years with 38.6% self sustained injury. Amitabh Singh et al reported 21-40 years age group as most commonly affected.[9]

Assault

In the present study nearly one fifth of the patients assault was the mode of injury. A similar finding was reported by M Swarnkar et al[6] with 27% and Philip Seidenberg et al with 20% of the injury were result of assault. In contrast Shriram V et al[7] had reported 10% injuries were result of assault and Amitabh Singh et al[9] had reported 14.5% assault injury in his study. In the present study common in the age group affected by assault injury was 20-39 years. Similar finding was reported by Amitabh singh et al and Philip Seidenberg et al in their studies.[9,13]

Train traffic accidents

In the present study 4% of the patients attending the orthopedic department were due to train traffic accidents. Similar finding was reported by Marvin Hsiao et al with a prevalence of 3% in his study.[14] Slightly lower prevalence of train traffic accidents (0.8%) was reported by Devarshi Rastogi in his study.[5] Train traffic accidents were more common in the age group of 20-39 years. Similar finding was reported by Ramesh NanajiWasnik in his study.[15]

Bull gore injury

In the present study the prevalence of bull gore injury was 2%. Similar finding was reported by M Swarnkar with a prevalence of 1.7% among the patients attending a trauma centre in India.[6] The age commonly affected in our study was 20-39 years similar findings was reported by Ankur Maheshwari with bull horn injury more common in the age group between 20-30 years.[16]

Type of injuries

In our study more than 50% of the injuries were of soft tissue injury followed by lower limb (18%) ,upper limb fracture (17.1%), spinal injuries (1.8%) and pelvic injuries(1.2%)Devarshi Rastogi et al had reported higher prevalence of all types of injuries abdominal(31%), upper and lower limb fracture (28% and 29%) , spinal injuries 18.3%. and pelvic injuries 7 percent.[5] Mariam Arif et al reported 27.5% were abdominal injuries, 16.37% were pelvic injuries, limb 18.96% and spine 1.72%.[17] In the

present study **t**he proportion of soft tissue injury, lower limb fracture, joint dislocation and multiple fractures were higher in males compared to females. Similar findings were reported by other investigators.[5,17] In the present all types of injuries were more common in the age group of 20-39 years and males outnumber females. Similar findings were reported by other investigators.[5-7]

CONCLUSION

In conclusion two third of them (73%) were males and the injury was more common (42%) in the age group of 20-39 compared to other age group. Road traffic was the most common mode of injury followed by self sustained and assault. The proportion of assault was higher in females compared to males. The knowledge on the modes and types of injury will help the policy makers to draft prevention policies. As the road traffic accidents being the commonest mode of injuries our strategy in creating awareness on road safety among the public has to be improved and intensive test on the knowledge of road safety before giving license to drive in India has to be made more stringent.

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Original Research Article

Adolescent Menstrual Problems In A Rural Community In Andhra Pradesh

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Abstract

Adolescents constitute 22 % of population in India. Adolescent period defined by WHO as human growth and development that occurs from ages 10-19 years. A cross sectional study was conducted to know the prevalence of menstrual problems and menstrual hygiene practices among adolescent girls in a sub centre of Thottambedu Primary health centre in chittoor district, Andhra Pradesh. Informed written consent was taken from the adolescent girls and their parents. Number of adolescent girls in the community was 405 out of which 346 could be contacted. Among them 300 girls who attained menarche were included in the study. The mean age of participants was 15.5±2.3yrs.The mean age of menarche was 13.6yrs. In the present study 16.66% of girls had menstrual irregularity, 44.46% had dysmenorrhea. Head ache,irritability and breast pain were the most common pre menstrual symptoms .The age of menarche in the present study correlated with other Indian studies .Though dysmenorrhea was a common problem, they did not seek treatment. Still 26.67% of the girls were using cloth and many of them were reusing it. Hence,it is neccessary to include information about menstruation, and hygienic practices as part of school curriculum in India and to provide counseling services for rural students.

Key words : Adolescent girl, Menstruation , Dysmenorrhea, Hygienic practices, Rural community

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INTRODUCTION

WHO defines adolescence as the period in human growth and development that occurs from ages 10 to19, after childhood and before adulthood. [(1)] Adolescence is marked by critical transition from childhood to adulthood. Menarche is a common biological milestone in adolescent girls. Adolescence is not only a period of rapid growth and development, but also marked by physiological and behavioral maturity. Adolescents constitute 22% of the population in India. [(2)] Hence the health of adolescents, especially girls is an important concern for policy makers, public health workers, medical professionals and parents. Menstrual health is fundamental to women's sexual and reproductive health. Common menstrual problems among adolescents are dysmenorrhoea, heavy menstrual bleeding and premenstrual syndrome. Among these, dysmenorrhoea is the most common, its prevalence being reported as 60 to 90% among adolescents, and a frequent cause of absenteeism from school or disruption of routine activity[(3)]. Seeking medical help for menstrual problems

depends on the socio economic, educational status of the parents. Apart from these, cultural beliefs and practices also influence the health care seeking behavior of adolescents and their parents.

In Western Europe where data for nearly last 200 years is available, the age of menarche has decreased from 17 years to 12.8 years [4]. In urban India the age of menarche was shown to be12.6 years, which is similar to the age of menarche in the developed world [5].Though large-scale data on the recent age of menarche in rural India is lacking, there is a general observation that age of menarche is late, around 15-16 years in rural girls who are relatively thinner and undernourished [6]. Awareness about menstrual hygiene may also differ between urban and rural girls. When girls enter this critical phase in their lives, they need to be educated and informed about normal menstruation, hygienicpractices, problems and also when and where to seek help in case of any abnormality. In this context, we felt a need to know the prevalence of menstrual problems and menstrual practices among adolescent girls in a rural community in the south Indian state of Andhra Pradesh.

AIMS & OBJECTIVES

1. To know the prevalence of menstrual problems among adolescent girls in a rural community

2. Problems related to menstruation amongst adolescent girls

3.To know treatment seeking behavior of adolescent girls

4.To know their practice of menstrual hygiene.

METHODOLOGY

Study design: This is a cross sectional study done in a rural community.

Study setting: A sub centre of Thottambedu Primary health centre in chittoor district, Andhra Pradesh was selected by random sampling. This sub centre has a population of 5658 with 2838 men and 2820 women

Study population:. The number of adolescent girls the community is 403. A total of 346 girls could be contacted. The remaining 57 girls could not be contacted as they were studying in other places. Out of the 346 girls, 300 girls who have attained menarche were included in the study.

The study was done after taking the approval of the institutional ethical committee. The medical officer of the primary health centre and the local government school authorities were informed and their permission was taken. Informed written consent was taken from the adolescents and their parents. A camp was conducted in the local school.with the help of the ANM (Auxiliary nurse midwife) of the area, all the girls in the area were examined by the investigators.The height, weight of the girls was noted.They were interviewed by the investigators using a pretested questionnaire in Local language. (Telugu)

Information about age of menarche, menstrual cycle length, amount of bleeding, frequency of cycles, symptoms like dysmenorrhoea and premenstrual symptoms was collected. Whether they used pads or cloth and how many per day, utilisation of the sanitary pads supplied by the government was also enquired into. A second visit was made by the investigators to meet those girls who were not present in the village at the first visit.

All the data was entered in an excel sheet. The data was analyzed by frequencies, percentages and means. Epiinfo 7.1.4.0 version was used for statistical analysis.

RESULTS

Table1: Demographics of study participants

AGE	FREQUENCY	PERCENT
10-12	46	13.28
13-15	116	33.53
16-19	184	53.19
EDUCATION		
ILLITERATE	8	2.31
PRIMARY	24	6.94

SECONDARY	250	72.25
INTER	52	15.03
COLLAGE	12	3.47
TOTAL	346	100.0

Age

The mean age of the participants was 15.5±2.3 years

Education

Majority of the girls were in high school

Socioeconomic status

91%of the girls in the sub centre belonged to low socio economic status based on their parent's income &occupation.

BMI

The mean BMI of the girls was 18.26±2.3kg/m²

Table2: Age of menarche

Menarche	Frequency	Percent
Not attained	46	13.30
10-12 years	32	9.25
13-15 years	248	71.68
>15 years	20	5.78
Total	346	100.00

Out of 346 girls, 46 have not attained menarche. Majority of the girls attained menarche between 13-15years.the mean age of menarche is 13.6years

Table 3: Regularity of cycles and age

AGE	Irregular	Regular	Percent of irregularity
11-12	0	14	0
13-14	8	66	10.8
15-16	14	56	20
17-19	28	114	19.7
TOTAL	50	250	16.66

About 83.33%of the girls had regular cycles whereas 16.66% had irregular cycles.Irregularity of cycles was more in the 15-19 years age group.3% of the girls had frequent cycles(<21 days)whereas 13.66% had less frequent cycles (>35 days)

Table 4: Menstrual flow:

Duration	Frequency	Percent
3-5days	282	81.50
6-8days	14	4.05
>8days	4	1.16
Padsper day		
>6 pads	2	0.67
4-6 pads	70	23.33
2-4 pads	224	74.67
<2	4	1.33
Total	300	100.00

Only four girls had prolonged cycles of more than 8 days. Only two girl had very heavy bleeding needing >6pads per day.

Table 5: Menstrual hygiene practices

Govt. supplied pads	Frequency	Percent
No	92	41.33
Yes	128	58.6
Pads/cloth		
cloth	80	26.67
pads	220	73.33
Total	300	100.00

73.33% of the girls used pads whereas 26.67% used cloth.58.67% of those using pads used Govt. supplied ones.23.4% of those using cloth reused it.

Table 6: Dysmenorrhea: severity

Dysmenorrhoea	Frequency	Percent
No	166	55.34
Yes	134	44.66
Severity of dysmenorrhoea		
severe	14	10.66
moderate	32	24
Less	14	10.66
No	74	55.34
Total	134	100.00

Out of the 300 girls who attained menarche, 44.66%had dysmenorrhoea. In 10.66%of them dysmenorrhoea was severe.23.33% of the girls with dysmenorrhoea took treatment, whereas 76.66% did not take any treatment.

Table 7: Reason for not attending school

Reason for not attending school	Frequency	Percent
Easy fatigability	66	22
Lack of facilities	12	4
Total	300	100.00

22% of the girls said the reason for not attending school during menstruation because of easy fatiguability, 74% said they did not attend due to disruption of routine work, whereas another 4% did not attend school due to lack of facilities

Table 8: Premenstrual symptoms:

symptom	Frequency	Percent
Breast pain	90	30
headache	108	36
Feeling heavy	36	12
irritation	132	44
sleeplessness	102	34
Any premenstrual symptoms	99	66

Some girls had more than one symptom 66% of the girls had at least one premenstrual symptom

Vaginal discharge

31.33% of the girls had vaginal discharge.

96% of the girls said that they had bath daily during menstruation.

DISCUSSION

In the present study, information about the age of menarche, problems of menstruation, prevalence of premenstrual symptoms, absenteeism from school during periods, practice of menstrual hygiene and

utilization of government supplied sanitary pads was collected from 300 adolescent girls in a rural community of AndhraPradesh.

Demographics:

Age:The mean age of participants in the present study is 15.5±2.3years. In other Indian studies, the mean age of the participants was 16.2 years and 15.92 respectively[7,8], whereas in a large Malaysian study of 2411 students, the mean age was15.4 years[9].

Education:In the present study, 72.2%ofthe participants are in secondary school. Most of the other studies also are done in secondary school students [9].

BMI:The mean BMI of the girls was 18.26±2.3 kg/m². Several studies found a linear relationship between BMI and the age of menarche and between BMI and menstrual irregularity. [10, 11]. But in the present study, most of the girls had a low BMI, hence no inference could be drawn between BMI and age of menarche or menstrual irregularity

Mean age of menarche:Mean age of Menarche in the present study was 13.6 years. This is similar to other Indian and Asian studies among rural communities and those coming from low socio economic status. [12] Studies done in girls belonging to urban and high socio economic status, have shown a lower mean age of menarche -12.6 years.[5]

Menstrual irregularity: In the present study 16.66%of the girls,had menstrual irregularity i.e cycles of <21 days or >35 days. Others [3] reported an incidence of 8.6% for cycles of <21 days and 15% for cycles>35 days. In the present study, the irregularity was more in the 15-17 years and 17-19 years age groups. In other studies, the long cycles persisted into late adolescence.

The frequency of heavy menstrual flow (>8days) was 1.16% in the present study. This is similar to the Malaysian study [3] but some Indian studies have shown a high incidence of 7-17%.[13,14] The difference may be due to the subjective interpretation of heavy bleeding by the participants and also due to the fact that the girls in the present study had low BMI.

Dysmenorrhoea: 44.66% of the subjects had dysmenorrhoea in the present study. In 10.66%of them, it was severe. 23% of the girls suffering from dysmenorrrhoea sought medical treatment. The rate of dysmenorrhea ranged from 45-64% in other Indian studies[7,12] Though a primary health centre is available nearby ,the low rate of treatment seeking in the present study may be due to inhibitions in the rural community.

Premenstrual symptoms :Among the premenstrual symptoms, irritability and headache were the commonest, followed by breast pain. 66% of the girls had atleast one premenstrual symptom. Other studies also reported a similar incidence of 67-77%[7,3]for Premenstrual symptoms

Absenteeism from school:In the present study, 22%of the participants did not attend school or college during periods, as they felt tired, whereas another 4% cited lack of facilities at the educational institutions for absenteeism. On the whole, 26%of the girls absented themselves from school during periods.An Ethiopian study[15] reports 54%school absenteeism. In Indian studies the prevalence ranges from 8.3%[16] to 43%[17]. Reasons for absenteeism include dysmenorrhoea, lack of privacy, easy fatigability and fear of leakage.

Menstrual hygiene management: The subject of menstrual hygiene is still taboo in the developing countries. 73.33% of the girls used pads whereas 26.67% used cloth in the present study.

Usage of sanitary pads was 11% [18,19] to 49%[14] in various Indian studies..MHM (menstrual hygiene management) studies by UNICEF[20] in India reported that 18% of school girls use sanitary pads and 30% use both cloth and sanitary pads. Compared to other Indian studies, the participants in the present study practiced better menstrual hygiene.

Utilisation of government supplied sanitary pads:In June 2010, the Ministry of Health and Family Welfare launched a program to provide highly subsidized sanitary napkins, under the brand "Free days", to 15 million adolescent girls across rural India. In the present study, 58% of the participants utilized the sanitary pads supplied by the government. There is a need to educate adolescent girls to make use of the freely supplied

sanitary pads. Also, 23%of those using cloth reused it. This may lead to reproductive tract infections if the cloth is not properly washed and dried. Privacy for washing and drying may also be lacking among poor households.

CONCLUSION

Age of menarche in the present study correlates with that in other Indian studies. BMI is low, indicating the poor nutritional status of the community. Menstrual irregularity is not high, may be because of the low BMI. Premenstrual symptoms and dysmenorrhoea are common. Most of the girls did not seek treatment for dysmenorrhoea. Absenteeism from school/college is 26%. There is a need to tackle this by counseling the girls and their parents and also by offering treatment for dysmenorrhoea and premenstrual symptoms. Facilities at schools and colleges for washing, changing the pads and safe disposal should be improved. The girls and their mothers should be counseled about switching to use of government supplied pads instead of cloth. Counseling can be done by teachers, local health workers and lady doctors.

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