HEALTHLINE

Correspondence

Disclaimer

INDEX

	Page No.

INDEX

Introducing Health Promoting Orientation in Hospitals: A Desirable Approach in the 21st Century

Amarjeet Singh[1], Akshay Anand[2], Nidhi Jaswal[3], Rajbir Kaur[4]

[1]Professor & Head, [3]Senior Demonstrator, [4]Junior Demonstrator; Health Promotion, Community Medicine & School of Public Health PGIMER, Chandigarh, Punjab, India

[2]Professor, Neurosciences, Neurology Department, PGIMER, Chandigarh, Punjab, India

Correspondence : Dr. Amarjeet Singh, Email:dramarjeet56@gmail.com

The role and purpose of hospitals has drastically changed over last two centuries. It is no longer restricted to providing curative services only. As per WHO Ottawa charter, health promotion concept is now being sought to be applied in all spheres of our lives and in all settings including the hospitals. In a Health Promoting Hospital (HPH), the facility design and planning should ensure adequate floor space for beds, safe water supply and sanitation, ventilation, hygienic conditions, hand washing facilities, isolation facilities, regulation of traffic flow, pest control, waste management, waiting facility, disabled friendly facilities. There is also a need to have a balance between functions and aesthetics of hospitals.

As per this concept, the emphasis of hospital care has now shifted from acute to chronic illness; curative to preventive medicine; restorative to comprehensive medicine; inpatient care to outpatient and home care; Individual orientation to community orientation; isolated function to area-wise or regional function; tertiary and secondary to primary health care and from episodic care to total quality care.

This approach can have a major public health impact by improving the quality of hospital care, limiting the dependence of patients and their caretakers on hospital staff, reducing the risk of the community from waste-related infections and above all, improving the health of staff which would eventually reduce absenteeism and enhance their productivity. This shift in perspective will surely yield rich dividends e.g., reduction of length of stay in hospital, reduction in complications, reduction in admission and readmissions. Healthcare professionals in hospitals can also have a lasting impact on influencing the behavior of patients and relatives, who will be more responsive to health advice given in hospitals.

HPH approach will also help in prevention of transmission of hospital acquired infections by adopting simple measures, e.g., washing of hands by medical/paramedical personnel before and after contacting each patient and specimen. Healthcare workers should receive vaccinations for hepatitis B, tetanus etc. Here, infection control committees may provide a forum for multidisciplinary input and cooperation, and information sharing.

Hospitals are in strong position to be the advocates for health promotion. They represent the main concentration of health service resources, professional skills and medical technology. In western countries, hospitals are increasingly positioning themselves as the leading providers of health promotion services within the community. This is important since even the health field concept entails that health and illness result from the interplay of genetic factors, environment, lifestyle and medical services. In India, this movement is yet to take off.

In this context, it is not out of context to mention that University Grants Commission, India held its 1st Round Table National Consultation for formulation of the policy on Health Promoting Universities (HPU) on 28th February 2019, in Delhi. The meet highlighted the involvement of universities in addressing the health needs of the community. By 2022, at least 50% of higher educational institutions are expected to implement core principles/ set standards of HPU. Also, emphasis was put on a need to evolve models of Academic Social Responsibility (ASR) and Institutional Social Responsibility (ISR). By implication, broadening of the scope of HPU to Health Promoting Educational Institutions will include medical colleges and apex medical institutions also. This envisages capacity building of students and staff for health promotion within and outside the hospitals. In fact, a good hospital must have a humanizing environment that can contribute positively to the health of patients as well as its staff by offering an atmosphere of safety, security, cleanliness and physical comfort.

The proposed HPH models may include consultations services to be provided for community participations & social interactions (e.g. student clubs).Organization of regular seminars or talks on health promotion may be encouraged with wider participation. So, apart from medical care provision, hospitals may arrange for periodic health check-ups through regular screening of students, staff and visitors.

Since Postgraduate Institute of Medical Education and Research (PGIMER) is an education and research institute, introduction of a concept of HPH can be one of the most cost effective investments it can make to improve the relationships with patients and community members. Of course, simultaneously, it has to retain and nurture the highest standards of service (patient care), education and research.

In fact, this has been pilot tested through the Neuroscience Research Lab of the institute, which has introduced ASR initiatives. Its members are dedicating 2 hours every week in actively cleaning the areas in and around the institute complex for more than 233 weeks now. Their goal was not only to create and sustain cleaner and healthier environment around the Institute but also to bring positive changes among patients, their relatives and people working in the Institute. Their work has resulted in a drastic change in the vicinity of the Institute. A dumping area was changed into a garden. Several dustbins were installed at the pavement where people used to litter the waste on the street. New urinals were also built near the boundary wall of PGIMER. A foot path was made through the lawns to prevent people from walking on grass.

Besides this, the Department of Community Medicine and School of Public Health, PGIMER, Chandigarh is also working towards interdisciplinary collaboration for enhancement of the patient/ caregivers' satisfaction through implementing the concept of 'Patient-Centred Care' in the Institute. Already, our humble contributions on the issue are uploaded on the PGI website (http://pgimer.edu.in/), under the icon of ''Public Forum'', drop down menu in 'patient empowerment' section. Here, our collaborative work on developing patient education material with Obstetrics and Gynecology, Orthopaedic and Surgery departments are summarised.

The Department has also initiated few new concepts like HPU, ASR and ISR within and around the campus since November 1, 2019. The initiative proposes to harness, harvest and nurture the vast unidentified and submerged potential of the students and staff of the department to enhance the image of PGIMER. The proposed venture is based on the fact that, so far, within the Department, the training of students of Master of Public Health and Bachelor of Public Heath was mostly class room based. It is proposed to involve them in practical ASR/ISR activities which will help in improving the institute's image. It is also proposed to develop a plan to enhance the quality of physical, social and mental environment of the institute. Moreover, 1 hour every Saturday has been given to "Open house session " in the Department which is open for all members to provide a platform for exchange of ideas on health related issues among the students, staff and employees.

For maximum output, hospital based health promotion services should be multi-disciplinary. Besides integrating health promotion policy for patients, staff and visitors into its vision, implementation of HPH concept requires strong leadership and commitment at different levels. Hospitals have the unique opportunity to embrace such change so that they can be a centerpiece of a 21st century intelligent health system. This level of change requires acceptance by all stakeholders for new values, visions and goals.

References:

1. Vasilescua R, Barnab C, Epurec M and Baicud C. Developing university social responsibility: A model for the challenges of the new civil society. Procedia Social and Behavioral Sciences 2010; 2: 4177–4182.

2. Anand A , Banik A, Minhas G et al. Creating a role model for "Academicians" Social Responsibility (ASR) synergizing with *Swachh Bharat Abhiyaan*: A campus hygiene initiative by PGIMER, Chandigarh. Annals of Neurosciences; 2019; 26:75-81

3. Singh AJ. Ideology of Health Promotion. In. "Health Promotion: Need for Public Health Activism Vol I ,Singh AJ, Goel S and Kathiresan J.(editors) Germany LAP LAMBERT Academic Publishing,2013.

4. Ahuja P K, Gupta AK, JainB, Singh A and. P Bains: Health Promoting Hospitals. In. Singh AJ, Goel S and Kathiresan J.(editors) Health Promotion: Need for Public Health Activism Vol II ,Germany LAP LAMBERT Academic Publishing,2013

5. Goel S, Gupta A.K, Singh A.J. Hospital Administration-A Problem Solving Approach. 1st Edition. Elsevier Publishers, India 2014

6. Mental health in the workplace. World Health Organization. 2019 [cited 3 December 2019]. Available from: https://www.who.int/mental_health/in_the_workplace/en/

The Profile of Risk Factors for Non-Communicable Diseases among the Urban Population in Garhwal Region of Uttarakhand, India

Janki Bartwal[1], Amit Kumar Singh[2]

[1] Assistant Professor, [2]Professor & Head, Department of Community Medicine, VCSG Govt. Medical Science & Research Institute, Srinagar, Garhwal, Uttarakhand, India

Correspondence : Dr. Amit Kumar Singh, Email: hodpsmvcsg@rediffmail.com

Abstract :

Introduction: Non communicable diseases (NCDs) are the leading causes of adult mortality and morbidity world-wide. NCDs currently cause more deaths than all other causes combined and NCD deaths projected to increase from 38 million in 2012 to 52 million by 2030. **Objectives :** 1.To know the socio-demographic profile of the study participants. 2. To study the behavioural and physiological risk factor's profile for non-communicable disease of the participants. **Method :** A community based cross-sectional study was conducted among the urban population in Garhwal region of Uttarakhand. Data collected was coded and entered into Microsoft excel sheet and was analysed using SPSS version 16. Chi square test was used to test the association and p value <0.05 was considered as significant. **Results :** Tobacco (current) and Alcohol (current) consumption was seen in 14.5% and 14.6% respectively. < 5 servings of fruits and vegetables was observed in 98% while 94.8% were taking ⩾5gm/day salt. 50.3% were physically inactive. 41.2% and 15.6% of the study participants respectively were having raised blood pressure and raised blood glucose level. In 76% of the study subjects, central obesity was present while 49% were having body mass index of ⩾25kg/m^2. There was statistically significant difference between male & female gender in regards to different behavioural and physiological risk factors. **Conclusion :** The prevalence of risk factors for non communicable is high. Since behavioural and physiological are modifiable risk factors, health education and awareness regarding life style modification is required.

Key words: Non-communicable diseases, Risk factors, Urban Population, WHO STEPS Approach

Introduction:

Noncommunicable diseases (NCDs) are one of the major health and development challenges of the 21st century, in terms of both the human suffering they cause and the harm they inflict on the socioeconomic fabric of countries, particularly low- and middle-income countries. NCDs currently cause more deaths than all other causes combined and NCD deaths projected to increase from 38 million in 2012 to 52 million by 2030. [1]

In India, NCDs contribute to around 5.87 million deaths that account for 60% of all deaths. [2] The main preventable risk factors for NCDs are tobacco consumption, harmful use of alcohol, unhealthy diet including high salt intake and physical inactivity. Other risk factors include stress, lack of dietary fibre, trans-fatty acids etc. If these behavioural risk factors are not modified they may lead to following biological risk factors: overweight/obesity, raised blood pressure, raised blood glucose and raised total cholesterol levels. [3]

Method:

Study settings and participants : A community based cross-sectional study was conducted in the urban field practice areas of a Government Medical college in Uttarakhand, from April 2018 to September 2018. The study area is a small town consisting of nine wards and having a population of 20,115 as per census 2011. People who were permanent residents of age 30 years and above, gave their voluntary consent to participate were included in the study. The critically ill, bed ridden, pregnant females were excluded from the study.

Sample size estimation : Sample size was calculated from the formula $4pq/l^2$, where p is the prevalence of raised blood pressure ($\geqslant$ 140/90mmHg) (p= 23%)[1] and q =100-p, l is the allowable error = 15% of p. Further considering non response rate of 15%, final sample size estimated was=684.

Sampling Technique : Out of the nine wards, 5 wards were randomly selected and all the households in these wards were considered in the sampling frame. Further only one eligible person from these household was selected by lottery method.

Study tool : A study tool based on the World Health Organization STEP wise approach to surveillance of non-communicable diseases and their risk factors (STEPS) was used.[4] The questionnaire was modified after conducting a pilot study on 30 individuals. Only STEP 1 & 2 were used because of limited resources. However, random blood sugar was estimated by glucometer. Modified Kuppuswamy classification for the year 2018 was used to assess the socio-economic status (SES) of an individual.

Operational definition

Current Tobacco users : Individuals, who at the time of survey were using tobacco products in any, form either smoking or smokeless, daily or occasionally.

Past Tobacco users : Individuals, who were using tobacco products in any, form either smoking or smokeless in the past, but now they are not using since one year preceding the survey.

Current Alcohol users : Individuals, who at the time of survey was consuming alcohol either daily or occasionally.

Past Alcohol users : Individuals, who were consuming alcohol either daily or occasionally in the past, but now they are not using since one year preceding the survey.

Fruits & vegetables consumption : Information on fruit and vegetable consumption was based on the number of daily servings eaten. Five or more servings were considered sufficient, and fewer than five

Junk food: Foods containing little or no proteins, vitamins or minerals but are rich in salt, sugar, fats and high in energy (calories).[6]

Salt intake : Increased salt intake was considered if salt consumption was more than 5 gram/person/day.[7] Amount of the salt (number of packets of 1 kg salt) consumed by the family per month and divided it by 30 (considering 30 days in a month) and number of persons living in the family. Hence, salt consumption per gram per day of an individual was calculated.

Physically active : For assessment of physical activity, the respondents were asked whether they undertook any kind of specific physical activity for at least 30 minutes during the day. Using the CDC guidelines, those who undertook moderate physical activity such as walking/sports for 30 minutes a day for at least 5 days a week were considered to be physically active.[8]

Hypertension : Individuals with systolic blood pressure (SBP) $\geqslant$ 140 mmHg, and/or diastolic blood pressure (DBP) $\geqslant$ 90 mmHg [9] and/or patient who were previously diagnosed case of hypertension by physician and/or were on treatment with anti-hypertensive drugs.

Diabetes : In a patient with classic symptoms of hyperglycaemia or hyperglycaemic crisis, a random plasma glucose $\geqslant$ 200 mg/dl [10] and/or patient who were previously diagnosed case of diabetes by physician and/or were on treatment with anti-diabetic drugs.

Waist Circumference (WC) : The cut off point for central obesity was defined as $\geqslant$ 90 cm for males & $\geqslant$ 80 cm for females as suggested for Asian ethnicity.[11]

Waist to Hip Ratio (WHR) : The cut off point for truncal obesity was defined as $\geqslant$ 0.9 for males & $\geqslant$ 0.8 for females as suggested for Asian ethnicity.[11]

Body Mass Index (BMI) : Individuals were classified into four groups: Underweight (BMI = <18.5kg/m^2), Normal (BMI = 18.5- 22.99kg/m^2), Overweight (BMI = 23-24.99kg/m^2) and Obese (BMI = $\geqslant$25kg/m^2).[12]

Physical Measurements

Height : measured to the nearest centimetre using a wall mounted measuring tape with the subject standing erect and barefoot.

Weight : measured to the nearest 0.1 kg using a Bathroom weighing scale.

Body Mass Index (BMI) : calculated as body weight in kilograms (kg) divided by square of the height in meter (m^2).

Waist circumference (WC) - measured to the nearest 0.1 cm using a non-stretchable measuring tape. Subjects were asked to stand erect with both feet together. WC was measured at the smallest horizontal girth between the lower end of the rib cage and the iliac crest.

Hip circumference (HC) - measured to the nearest 0.1 cm at the greatest horizontal circumference below the iliac crest, at the level of greater trochanter with the subject in standing position & both feet together.

Waist to Hip Ratio (WHR) - calculated with the corresponding values of waist and hip circumference.

Blood Pressure (BP) - BP was measured using mercury sphygmomanometer in the sitting posture with an appropriate- sized cuff encircling the arm. Two readings were taken in a resting patient at a 5-minutes interval, and the average of the two readings was reported. Blood sugar – capillary blood glucose was measured by glucometer.

Statistical analysis : Data collected was coded, entered into Microsoft excel and were analyzed using the Statistical Package for the Social Sciences version 16 software (SPSS Inc., Chicago, IL, United States).Chi-square test was used to analyze the difference between proportions. value of less than 0.05 was considered statistically significant.

Ethical considerations : The study subjects were explained the purpose of the study, and written informed consent was taken. Complete privacy and confidentiality of participation was assured. Approval by Institutional Ethics Committee was taken before the commencement of study.

Results :

Socio demographic characteristic of the study subjects shows that majority 209 (30.6%) of the people were in 30-39 years of age group, females 458 (67%), married 589 (86.1%), having post graduate degree 122 (17.8%), housewife 396 (57.8%) and belongs to upper lower class 264 (38.6%). [Table 1]

Behavioural risk factors profile of the study participants revealed that 543 (79.4%) of the subjects had never use tobacco in any form i.e., either smoking or smokeless while 539 (78.8%) had never consume alcohol in their life. 455 (66.6%) were taking 1-2 servings of fruit and vegetables per day while salt consumption among 648 (94.8%) of the study subjects were >5 grams per day. Junk food consumption was present among 290 (42.4%) of the patients. 340 (49.7%) were physically active with undertaking various activity for ⩾ 5 days a week. Physiological risk factors profile of the study subjects revealed that 195 (28.5%) were known case of raised blood pressure while 87(12.7%) were newly diagnosed. 102 (14.9%) were aware of their diabetic status prior to the survey while 5 (0.7%) were newly diagnosed case of diabetes. 520 (75.9%) were having increased waist circumference while 626 (91.4%) were found to be having increased waist hip ratio. 151 (22.1%) and 335 (48.9%) of the study participants were overweight and obese respectively. [Table 2]

Amongst various risk factors, tobacco consumption, alcohol consumption, raised blood pressure, raised blood glucose level was found to be more prevalent in males as compared to females and this difference was statistically significant. While females were less physically active, eating more of junk food, having increased waist circumference, increased waist hip ratio and body mass index. This difference between the two genders was also statistically significant. No statistically significant difference was found for less than 5 servings per day of fruits and vegetables and >5gm/day salt intake. [Table 3]

Table 1: Socio demographic characteristics of the study participants (N=684)

Variables	Frequency	Percentage
Age group (years)		
30-39	209	30.6
40-49	162	23.7
50-59	131	19.1
⩾60	182	26.6
Sex		
Male	226	33.0
Female	458	67.0
Marital Status		
Never Married	10	1.5
Married	589	86.1
Widowed	85	12.4
Educational Status		
Illiterate	107	15.7
Primary	81	11.8
Middle	67	9.8
High School	86	12.6
Intermediate	104	15.2
Graduate/diploma	117	17.1
PG/Professional degree	122	17.8
Occupation		
Housewife/Unemployed	399	58.3
Unskilled	50	7.3
Semiskilled	41	6.0
Skilled	66	9.6
Clerical/shop/farmer	51	7.5
Semi-professional	67	9.8
Professional	10	1.5
Social class#		
Upper	55	8.0
Upper Middle	101	14.8
Lower Middle	162	123.7
Upper Lower	264	38.6
Lower	102	14.9

as per modified prasad classification

Table 2: Prevalence of behavioral and physical risk factors among the study participants

Variables	Frequency (N=684)	Percentage %
Tobacco consumption		
Current	99	14.5
Past	42	6.1
Never consumed tobacco	543	79.4
Alcohol consumption		
Current	100	14.6
Past	45	6.6
Never consumed alcohol	539	78.8
Fruit & vegetables servings/day		
≥5	14	2.0
3-4	215	31.4
1-2	455	66.6
Salt intake (gm)/person/day		
≤5	36	5.2
>5-10	320	46.8
>10-15	214	31.3
>15	114	16.7
Junk food Consumption		
Present	290	42.4
Absent	394	57.6
Physically active		
Yes	340	49.7
No	344	50.3
Blood Pressure (mmHg)		
H/o Raised Blood Presure	195	28.5
New cases of HTN	87	12.7
Normal	402	58.8
Blood Sugar (mg/dl)		
H/o Raised Blood Sugar	102	14.9
New cases of DM	05	0.7
Normal	577	84.4
Waist Circumference (cm)		
Normal	164	24.0
Increased	520	76.0
Waist/Hip Ratio		
Normal	58	8.5
Increased	626	91.5

Body Mass Index (kg/m2)		
<18.5	28	4.1
18.5-22.99	170	24.8
23.0-24.99	151	22.1
25.00-29.99	247	36.1
≥30	88	12.9

Table 3: Behavioral and physical risk factors of the study participants according to sex

Variables	Males n = 226 (%)	Females n = 458 (%)	p value
Tobacco consumption			
Current	87 (38.5)	12 (2.6)	p = 0.000*
Past	39 (17.2)	03 (0.7)	
Never consumed tobacco	100 (44.3)	443 (96.7)	
Alcohol consumption			
Current	100 (44.3)	00 (0.0)	p = 0.000*#
Past	45 (19.9)	00 (0.0)	
Never consumed alcohol	81 (35.8)	458 (100.0)	
Fruit & vegetables servings/day			
≥5	03 (1.3)	11 (2.4)	p = 0.585
3-4	69 (30.5)	146 (31.9)	
1-2	154 (68.2)	301 (65.7)	
Salt intake (gm)/person/day			
≤5	08 (3.5)	28 (6.1)	p = 0.156
>5-10	105 (46.5)	215 (46.9)	
>10-15	75 (33.2)	139 (30.3)	
>15	38 (16.8)	76 (16.6)	
Junk food			
Present	82 (36.3)	208 (45.4)	p = 0.023
Absent	144 (63.7)	250 (54.6)	
Physically active			
Yes	158 (70.0)	182 (39.7)	p = 0.000*
No	68 (30.0)	276 (60.3)	
Blood Pressure (mmHg)			
H/o Raised BP	75 (33.2)	120 (26.2)	p = 0.001*
New cases of HTN	40 (17.7)	47 (10.3)	
Normal	111 (49.1)	291 (63.5)	

Blood Sugar (mg/dl)			
H/o Raised BS	53 (23.5)	49 (10.7)	p = 0.000*
New cases of DM	00 (0.0)	05 (1.1)	
Normal	173 (76.5)	404 (88.2)	
Waist Circumference (cm)			
Normal	81 (35.8)	83 (18.1)	p = 0.000*
Increased	145 (64.2)	375 (81.9)	
Waist/Hip Ratio			
Normal	33 (14.6)	25 (5.5)	p = 0.000*
Increased	193 (85.4)	433 (94.5)	
Body Mass Index (kg/m^2)			
<18.5	13 (5.7)	15 (3.3)	
18.5-22.99	74 (32.7)	96 (20.9)	p = 0.000*
23.0-24.99	44 (19.5)	107 (23.4)	
⩾25.00-29.99	82 (36.4)	165 (36.0)	
⩾30	13 (5.7)	75 (16.4)	

*p<0.05 is significant, # - chi square with yates correction

Discussion:

In the present study, 38.5 % and 17.2% of the males respectively were consuming tobacco currently and in the past in comparison to 2.6% and 0.7 % of the females. The prevalence of tobacco consumption among males and females was comparable to several other studies [13-19] done in urban areas of India and the gender difference were also found as statistically significant in their research.

Alcohol consumption was reported by male's participants only; the prevalence being 44.3%. It is comparable to that reported by Oommen AM et al, [19] while it is more than Chauhan RC et al, [15] Krishnan K et al [16] and less than Garg A et al.[13] In Chauhan RC et al [15] and Krishnan K et al, [16] none of the females were taking alcohol while 2.7% and 0.1% of the females were consuming alcohol in study done by Garg A et al [13] and Oommen AM [19] respectively, the gender difference were significant in these studies also.

Consumption of < 5 servings of fruits & vegetables per day were reported by 670 (97.9%) of the participants, (male – 98.7% and female – 97.6%). There is no significant difference between the two sexes. Similar findings were reported by other researchers in their studies. The prevalence was comparable to other studies [13, 14, 17, 19] while more than that observed by Chauhan RC et al [15] and Kadarkar KS et al [16] in their research.

In the present study, salt intake >5 gm/day was consumed by 94.8%. Thakur JS et al [20] reported 88.3% of the study subjects consuming higher salt in urban areas of Punjab.

Physical inactivity was reported among 50.3% of the study subjects, more among females (60.3%) then that of males (30%) may be because majority of them are housewives and hence busy in their household chores. This difference between male and female sex was statistically significant. Similar findings were observed by other researchers. [13,17,19] While Aroor B et al, [14] Chauhan RC et al [15] and Kadarkar KS et al [16] observed males were more physical inactive in comparison to that of females.

High blood pressure was observed in 282 (41.2%) [Male (50.9%) & female (36.5%)] and this difference was statistically significant in present study. The prevalence of blood pressure was more than that observed by all other researchers.[13-19,21]While it is comparable to observation made by Thakur JS et al [20] and Htet AS et al. [22]The difference in prevalence of raised blood pressure between the two sex was found to be statistically significant difference by Aroor B et al,[14] Krishnan K et al [17] and Oommen AM et al [19] while no statistically significant difference was observed in others.[13, 15, 16, 18]

In present study, raised blood sugar was observed in 107 (15.6%), male (23.5%) & female (11.8%) and difference was statistically significant. In study done by Garg A et al [13] and Oommen AM et al [19]the prevalence of diabetes was more than ours, i.e., 18% and 23.6% respectively and the gender difference was not found to be statistically significant.

In this study, increased waist circumference was observed more in females (81.9%) participants than males (64.2%) and this difference was found to be statistically significant. The other researchers [13-15, 18,19] have also reported similar findings of increased waist circumference more in females than in males and this difference being statistically significant.

In the present study, increased waist hip ratio was observed more in females (94.5%) in comparison to that of males (85.4%) and this difference were statistically significant. While in studies conducted by Oli N et al [21]and Htet AS et al[22]though the waist hip ratio was reported to be more in females' subjects but no statistically significant gender difference was found.

In this study, 42% of the male and 52% of female participants were having BMI $\geqslant$ 25 kg/m^2 and this difference was found to be statistically significant. Similar findings were reported by Garg A et al [13]and Oommen AM et al [19]while Aroor B et al [14] and Chauhan RC et al [15]reported male having slightly higher prevalence of overweight /obese among males, also the difference between two genders was not significant.

Conclusion:

The prevalence of behavioural and physiological risk factors present among the study participants, likeconsumption of tobacco & alcohol among males and more number of females being physically less active, hence having increased central & generalised obesity points towards the fact that burden of non-communicable diseases will continue to rise in near future. There is a need for self-motivation for adapting better lifestyle if we want to curb the prevalence of lifestyle related diseases.

Limitations of the study:

It is cross-sectional study. Behavioural risk factors are self-reported, so there can be under or overestimation in the findings. The resource constraints have prevented us from collecting data related to biochemical risk factors for non-communicable diseases.

Declaration:

Funding: Nil

Conflict of Interest: Nil

References:

1. World Health Organization. Global status report on non-communicable diseases 2014. Geneva: World Health Organization; 2014. [accessed on 2018, June 24] Available from: http://whqlibdoc.who.int/publications/2014/9789241564854_eng.pdf

2. Park K. Epidemiology of Chronic Non-communicable Diseases and Condition. In Park's Textbook of Preventive and Social Medicine, 24th ed. Jabalpur: Banarsidas Bhanot Publishers; 2017: pp. 380-431.

3. Taneja DK. National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke. In DK Taneja's Health Policies & Programmes in India, 15thed. New Delhi: Jaypee Brothers Medical Publishers Ltd; 2017: pp. 429-41.

4. WHO STEPS surveillance manual: the WHO STEPwise approach to chronic disease risk factor surveillance. Geneva: World Health Organization; 2008 [accessed on 2018, May 8]. Available from: http://www.who.int/chp/steps/en/

5. World Health Organization. Diet, nutrition and the prevention of chronic diseases. Report of a joint WHO/FAO expert consultation. In: WHO Technical Report Series No 916. Geneva: World Health Organization; 2003.

6. Dietary Guidelines for Indians: A manual, 2nded. Hyderabad: National Institute of Nutrition Indian Council of Medical Research; 2011: pp.77.

7. World Health Organization. Guideline: Sodium intake for adults and children. Geneva: World Health Organization; 2012.

[accessed on 2019, March 04] Available from: https://www.who.int/nutrition/publications/guidelines/sodium_intake_print version.pdf

8. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Centre for Chronic Disease Prevention and Health Promotion, Division of Nutrition and Physical Activity. Promoting physical activity: A guide for community action. Human Kinetics: Champaign, IL; 1999.

9. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL Jr, et al. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of high blood pressure: The JNC 7 report. JAMA 2003; 289 (19):2560–71.

10. American Diabetes Association.2. Classification and diagnosis of diabetes: Standards of Medical Care in Diabetes-2018. Diabetes Care 2018; 41(Suppl. 1):S13–S27 [accessed on 2019, February 24] Available from https://diabetesed.net/wp-content/uploads/2017/12/2018-ADA-Standards-of-Care.pdf

11. Waist Circumference and Waist Hip ratio. Report of a WHO Expert Consultation, Geneva, 8-11 Dec. 2008 [accessed on 2013, September 14]. Available from http://www.who.int/nutrition/publications.

12. WHO. The Asia Pacific perspective. Redefining obesity and its treatment. World Health Organization (WHO), 2000. International Association for the study of Obesity and International Obesity Task Force. Melbourne International Diabetes Institute.

13. Garg A, Anand T, Sharma U, Kishore J, Chakraborty M, Ray PC, et al. Prevalence of risk factors for chronic noncommunicable diseases using who steps approach in an adult population in Delhi. J Fam Med Primary Care 2014; 3: 112-8.

14. Aroor B, Trivedi A, Jain S. Prevalence of risk factors of non-communicable diseases in a district of Gujarat, India. J Health Popul Nutr 2013; 31: 78-85.

15. Chauhan RC, Purty AJ, Natesan M, Velavan A, Singh Z. Risk factors profile for noncommunicable diseases among adult urban population of Puducherry in India. J Obes Metab Res 2014; 1:201-8.

16. Kadarkar KS, Velhal GD, Tiwari SR. Preventable Risk Factors for Non Communicable Diseases in Urban Slum of Mumbai: A Prevalence Study using WHO STEPS Approach. Ntl J Community Med 2016; 7(8):672-6.

17. Krishnan A, Shah B, Gupta V, Khaparde K, Paul E, Menon GR, et al. Risk Factors for Non-communicable Disease in Urban Haryana: A Study Using the STEPS Approach. Indian Heart J 2008; 60: 9–18.

18. Acharyya T, Kaur P, Murhekar MV. Prevalence of behavioral risk factors, overweight and hypertension in the urban slums of North 24 Parganas District, West Bengal, India, 2010. Indian J Public Health 2014; 58:195-8.

19. Oommen AM, Abraham VJ, George K, Jose VJ. Prevalence of risk factors for non-communicable diseases in rural & urban Tamil Nadu. Indian J Med Res 2016; 144: 460-71.

20. Thakur JS, Jeet G, Pal A, Singh S, Singh A, Deepti SS etal. Profile of Risk Factors for Non-Communicable Diseases in Punjab, Northern India: Results of a State-Wide STEPS Survey. PLOS ONE 2016; 11(7):1-16.

21. Oli N, Vaidya A, Thapa G. Behavioural Risk Factors of Non communicable Diseases among Nepalese Urban Poor: A Descriptive Study from a Slum Area of Kathmandu. Epidemiology Research International 2013; 1-13.

22. Htet AS, Bjertness MB, Sherpa LY, Kjøllesdal MK, Oo WM, Meyer HE, et al. Urban-rural differences in the prevalence of non-communicable diseases risk factors among 25–74 years old citizens in Yangon Region, Myanmar: a cross sectional study. BMC Public Health 2016; 16: 1225.

Study on Prevalence of Protein Energy Malnutrition among Children of 3-6 Years of Age in the Study District

Malay Savalia[1], Sumit Unadkat[2]

[1]Resident Doctor, [2]Associate Professor, Shree M. P. Shah Government Medical College, Jamnagar, Gujarat, India

Correspondence : Dr Sumit Unadkat, E mail: drsumitpsm@gmail.com

Abstract :

   Introduction : Children are generally most vulnerable and least able to help themselves. Malnutrition in its several forms of under nutrition has been coined as "silent emergency" by United Nations Children's Fund (UNICEF). Rural area shows inequalities in distribution of beneficiaries in form of structure, performance and pattern of economic growth. **Objectives :** To estimate prevalence of Protein Energy Malnutrition (PEM), to find out association between various factors and prevalence of malnutrition and to assess various aspects of feeding of child with prevalence of malnutrition in children of 3-6 years of age. **Method :** A community based cross sectional study was conducted on 3-6 years old children of rural area of study district. **Results :** Out of total 894 children, 27.96% children were underweight and 6.71% children were severely underweight. Malnutrition was seen in 42.78% children amongst those who did not consume calories as per Recommended Dietary Allowarce (RDA). **Conclusion :** Protein energy malnutrition in form of underweight was present in more than one third children. Higher prevalence of malnutrition was found in children who had birth weight of less than 2.5 kilograms, having interpregnancy interval of less than 24 months, of birth order of 4 or more, who were breastfed for a period of 6 to 12 months, to whom complementary feeding was started before the age of 6 months or who were partially immunized.

Key words : Children of 3-6 years of age, Protein energy malnutrition, Underweight

Introduction :

The hearts of most grown-ups melt at the sight of small children who constitute one of the most vulnerable sections of society. Children are our supreme assets because children of today form the human resource of tomorrow. [1] Children need extra care because these are generally the most vulnerable and least able to help themselves. Interventions early in life can thus have lifelong benefits not just for individual but for society as a whole. [2]

It is now an established fact that the brain undergoes development and growth within the first five years of a child's life. Therefore, malnutrition of children under 5 years will surely lead to reduced mental abilities affecting the intellectual capabilities of the children when they reach adulthood. It is well recognised and documented that preschool children are a nutritionally vulnerable segment of population and their growth and nutritional status are useful and sensitive indicators for judging health of a community or a nation.[3, 4] Early childhood is a period of rapid growth and that nutritional insults during this period result into under or over nutrition. [5, 6]

Malnutrition in its several forms of under nutrition, namely wasting, stunting and underweight has been coined as the "silent emergency" by the United Nations Children's Fund (UNICEF). [7] Malnutrition and infection are the two most important factors that affect the growth of children. Under nutrition is associated with impaired immune function and consequent increased susceptibility to infections; infections aggravate undernutrition; if this vicious cycle continues it can result in death of the child. Nutrition plays a key role in physical, mental and emotional development of children and much emphasis has been given to provide good nutrition to growing populations especially in the formative years of life. [8]

The subject gains more importance in rural children, due to certain adverse realities like

intake, frequent infections, lack of access to health services, illiteracy, unhygienic personal habits, adverse cultural practices etc. Major factors which modulate nutritional status during early childhood include birth weight, infant and young child feeding practices, morbidity due to infections, treatment of infections, nutrition care during infection and convalescence. Factors which are responsible for the higher prevalence of malnutrition comprise low birth weight, maternal health problems, delay in introduction of complementary feeds, faulty child care and other poor environmental conditions which are again more prevalent in rural areas.[9] In association to neonatal and infant mortality and morbidity Low Birth Weight (LBW) is also associated with growth retardation in children and development of chronic diseases such as diabetes mellitus, cardiovascular diseases and hypertension in adults.[10] Anthropometric assessment is widely used and often regarded as the best single measure for health and nutritional status in children.[11]

Globally 52 million children under 5 years of age are wasted, 17 million are severely wasted and 155 million are stunted. Around 45% of deaths among children under-5 years of age are linked to undernutrition.[12] According to National Family Health Survey (NFHS) – 4, under-5 mortality in India is 50 per 1000 live births, 38.4% children under 5 years of age are stunted, 21% are wasted, 7.5% are severely wasted and 35.7% are underweight.[13]

Rural area shows inequalities in the distribution of the beneficiaries in the form of structure, performance and pattern of economic growth. Present study was undertaken on a socio-cultural and economically underprivileged group i.e. children of 3-6 years of age of rural area aiming to estimate prevalence of Protein Energy Malnutrition (PEM) among them. Apart from prevalence attempts are made to identify relationship of birth outcome, socio economic status, nutritional status, morbidity pattern, immunization status and factors associated with those on prevalence of Protein Energy Malnutrition (PEM).

Objectives :

- To estimate the prevalence of Protein Energy Malnutrition (PEM) in children of 3-6 years of age.

- To find out association between various factors and prevalence of malnutrition in children of 3-6 years of age.

- To assess various aspects of feeding of child with prevalence of malnutrition in children of 3-6 years of age.

Method :

Community based cross sectional study was conducted from August 2017 to August 2018. Present study was carried out on 3-6 years old children of rural area of the study district. All the children of 3-6 years of age group in the district were the target population. Sample size was calculated for the population of 157556 children as per Census 2011 Data. Prevalence of malnutrition among under-5 children in rural area of the study district is 33.2%.[14] With precision level of 4%, taking design effect of 1.5 and considering non-response rate around 10% the final sample size was (n) $\approx$ 875 children of 3-6 years.

Two stage sampling technique was used. In first stage, from total 6 talukas of the study district, 35 villages were selected by cluster sampling technique. In second stage, from total 35 villages, 25 children of 3-6 years of age group were selected after obtaining list of all children in the age group of 3-6 years from the anganwadi by simple random sampling technique from each village. Thus total 875 children were selected from the study district as samples.

Data were collected in a predesigned and pretested proforma after getting consent from the parents and the information was obtained from mother or primary care giver of child. Data collection was divided in to interview schedule and anthropometric measurements. Close ended interview schedule was designed for the mother or the primary care taker of children.

Weight, height and mid arm circumference were measured of all study subjects as anthropometry is very sensitive and useful tool to measure nutritional status.

Data entry was done in EPI INFO software. Z scores were compared for weight for age using Microsoft Excel software. Data analysis was primarily

carried out in EPI INFO software. EPI INFO software and Microsoft Excel were used to create graphs for present study. Descriptive analysis was done for all predictor and outcome variables. Chi square test was used to find association between predictor and outcome variables.

Under nutrition is the outcome variable in the present study and it was calculated by parameter WAZ (weight for age). WHO growth standards were used to define under nutrition. Weight-for-age is a composite index of height-for-age and weight-for-height. It takes into account both acute and chronic undernutrition. Children whose weight-for-age Z-score was below minus two standard deviations (-2 SD) from the median of the reference population were classified as underweight. Children whose weight-for-age Z-score was below minus three standard deviations (-3 SD) from the median were considered severely underweight.

Results :

Table 1 shows that about two-fifth of 894 children i.e. 363 (40.6%) were in the age group of 4-5 years, followed by 309 (34.56%) in the age group of 3-4 years and 222 (24.83%) in the age group of 5-6 years. Observation also shows that out of 894 children 463 (51.79%) were males and 431 (48.21%) were females.

Table 2 reveals that out of 894 children, 310 (34.68%) children were malnourished of whom 250 (27.96%) were underweight while 60 (6.71%) were severely underweight. Sex wise distribution of malnutrition was found to be somewhat higher in females (35.27%) than males (34.13%).

Table 1 : Age and sex wise distribution of children

Age Group	Male		Female		Total	
	No.	%	No.	%	No.	%
3-4 years	157	33.91%	152	35.27%	309	34.56%
4-5 years	195	42.12%	168	38.98%	363	40.60%
5-6 years	111	23.97%	111	25.75%	222	24.83%
Total	463	100.00%	431	100.00%	894	100.00%

Table 2: Distribution of children according to their Weight for Age (Underweight)

Weight for Age (Underweight)	Male		Female		Total	
	No.	%	No.	%	No.	%
Normal ≥-2SD	305	65.87%	279	64.73%	584	65.32%
Underweight < -2SD and ≥3SD	135	29.16%	115	26.68%	250	27.96%
Severe underweight < -3SD	23	4.97%	37	8.58%	60	6.71%
Total	463	100.00%	431	100.00%	894	100.00%

Table 3: Association between consumption of calories as per recommended daily allowance (RDA) and malnutrition in children

Consumption of calories as per Recommended Daily Allowance (RDA)	Normal		PEM		Total	
	No.	%	No.	%	No.	%
Yes	279	77.29%	82	22.71%	361	100.00%
No	305	57.22%	228	42.78%	533	100.00%
Total	584	65.32%	310	34.68%	894	100.00%

(χ^2 = 38.243, DF = 1, p < 0.00001)

Table 4: Association between various demographic variables and malnutrition in children

Variables	Normal (%)	PEM (%)	Total (%)	χ^2 value	*p* value
Social class					
Upper	260 (73.03%)	96 (26.97%)	356 (100%)	15.522	0.000082
Lower	324 (60.22%)	214 (39.78%)	538 (100%)		
Type of family					
Nuclear	219 (62.93%)	129 (37.07%)	348 (100%)	4.171	0.124
Joint	215 (64.18%)	120 (35.82%)	335 (100%)		
Three generation	150 (71.09%)	61 (28.91%)	211 (100%)		
Overcrowding					
Present	354 (61.78%)	219 (38.22%)	573 (100%)	8.85	0.00293
Absent	230 (71.65%)	91 (28.35%)	321 (100%)		
Literacy status of mother					
Illiterate	123 (58.29%)	88 (41.71%)	211 (100%)	6.027	0.0141
Literate	461 (67.5%)	222 (32.5%)	683 (100%)		
Occupation of mother					
Home maker	467 (67.88%)	221 (32.12%)	688 (100%)	20.975	0.00032
Service	15 (88.24%)	2 (11.76%)	17 (100%)		
Business	8 (80%)	2 (20%)	10 (100%)		
Labourer	35 (47.95%)	38 (52.05%)	73 (100%)		
Agricultural	59 (55.66%)	47 (44.34%)	106 (100%)		

According to table 3 prevalence of malnutrition was higher (42.78%) in children who did not consume calories as per Recommended Daily Allowance (RDA) for their age in comparison to those children who were consuming calories as per RDA (22.71%). Observed difference was statistically highly significant.

Table 5: Association between various indicators in children and PEM

Indicators	Normal (%)	PEM (%)	Total (%)	χ^2 value	*p* value
Birth weight					
< 2.5 kg	32 (45.71%)	38 (54.29%)	70 (100%)	12.893	0.00033
≥ 2.5 kg	552 (66.99%)	272 (33.01%)	824 (100%)		
Period since last birth (months)					
< 24	55 (53.92%)	47 (46.08%)	102 (100%)	13.806	0.001
24 - 36	89 (57.42%)	66 (42.58%)	155 (100%)		
> 36	184 (71.6%)	73 (28.4%)	257 (100%)		
Birth order					
1	256 (67.37%)	124 (32.63%)	380 (100%)	14.995	0.00182
2	232 (68.24%)	108 (31.76%)	340 (100%)		
3	67 (61.47%)	42 (38.53%)	109 (100%)		
4 or more	29 (44.62%)	36 (55.38%)	65 (100%)		
Duration of breast feeding					
< 6 months	16 (76.19%)	5 (23.81%)	21 (100%)	1.121	0.571
6-12 months	39 (65%)	21 (35%)	60 (100%)		
> 12 months	529 (65.07%)	284 (34.93%)	813 (100%)		
Age at complementary feeding					
Before 6 months	32 (50%)	32 (50%)	64 (100%)	7.147	0.00751
At or After 6 months	552 (66.51%)	278 (33.49%)	830 (100%)		
Immunization status					
Fully immunized	571 (67.41%)	276 (32.59%)	847 (100%)	31.069	< 0.00001
Partially immunized	13 (27.66%)	34 (72.34%)	47 (100%)		

Table 4 shows association between various demographic variables and malnutrition in children. The prevalence of malnutrition was higher i.e. 39.78% in children belonging to lower social class compared to children belonging to upper social class (26.97%). Observed difference was statistically highly significant. Prevalence of malnutrition was higher i.e. 37.07% in children belonging to nuclear families, followed by 35.82% and 28.91% in children belonging joint families and three generation families respectively. Observed difference was statistically not significant. Distribution of children according to type of house revealed that prevalence of malnutrition was higher (38.22%) in children who dwelled in overcrowded houses, while it was lower (28.35%) in children who dwelled in houses where there was no overcrowding. Observed difference was statistically significant. Literacy status of mothers showed that prevalence of malnutrition was high in children of mothers who were illiterate i.e. 41.71%, while prevalence of malnutrition was less (32.5%) in children of mothers who were literate. Observed difference was statistically significant. Prevalence of malnutrition was higher among children of mothers who were labourers and involved in agricultural work (52.05% and 44.34% respectively) as compared to those children whose mothers were home maker (32.12%), doing business (20%) or doing service (11.76%). Observed difference was statistically highly significant.

Table 5 shows association between various variables related to children and malnutrition in them. Prevalence of malnutrition was higher i.e. 54.29% in children who had birth weight of less than 2.5 kilograms, as compared to children (33.01%) who had birth weight of more than 2.5 kilograms.Observed difference was statistically highly significant. In the present study, prevalence of malnutrition was highest i.e. 46.08% in children having interpregnancy interval of less than 24 months followed by 42.58% and 28.4% in children having interpregnancy interval between 24 to 36 months and more than 36 months respectively. Observed difference was statistically highly significant. The prevalence of malnutrition was high i.e. 55.38% in children of birth order of 4 or more followed by 38.53% and 32.63% in children of birth order 3 and 1 respectively. The prevalence of malnutrition was lowest i.e. 31.76% in children of birth order 2. Observed difference was statistically highly significant. Results also revealed that the prevalence of malnutrition was 35% in children who were breastfed for a period of 6 to 12 months as compared to 34.93% and 23.81% children who were breast fed for more than 12 months and less than 6 months respectively. Observed difference was statistically not significant. Prevalence of malnutrition was less in children to whom complementary feeding was started at or after the age of 6 months (33.49%), whereas it was higher in children to whom complementary feeding was started before the age of 6 months (50%). Observed difference was statistically significant. Immunization status of children showed that the prevalence of malnutrition was high in partially immunized children i.e. 72.34%, while it was 32.59% in fully immunized children. Observed difference was statistically highly significant.

Discussion:

According to National Family Health Survey (NFHS) – 4, 35.7% children under 5 years of age were underweight and 11% children were severely underweight. The results were similar to the present study. National Family Health Survey – 4 (2015-2016) reported that poor rich ratio was nearly 2.5 for underweight category meaning lowest quintile group has 2.5 times more prevalence of underweight (48.6%) compared to highest wealth quintile group (20.1%). [15]The results of the present study were slightly different from NFHS – 4. The reason behind higher number of children being malnourished belonging to nuclear families was lack of knowledge regarding proper feeding habits or working parents. Mahendraker et al (1996) [16] found similar results in their study that morbidity in children was more common in overcrowded houses than in non overcrowded house. A. Mittal and S. K. Ahluwalia (2007) [17] in their study also found similar results of high prevalence of malnutrition in children of illiterate mothers (60.9%) as compared to children of mother's education above high school level (21.2%). A. Mittal and J. Singh (2007) [17] also found similar results of high prevalence among children of working mothers (46.15%) as compared with housewives (37.8%).

M. Shafiqur Rahman et al. (2016) [18] found similar results that the prevalence of malnutrition was high (56.2%) in children with low birth weight as compared to children (38.1%) having normal birth weight. J. Lakshmi A and K. Begum (2003) [19] in their study also found similar results of higher prevalence of malnutrition with higher birth order, it was found 34% in birth order 1, 39% in birth order 2-3 and 56% in birth order more than 4 or more. Victora CG et al. (1984) [20] in their study found that prevalence of malnutrition was smallest in those children breast-fed for 3 to 6 months, but after this age nutritional status appeared to be worse in those breast-fed for longer. The results were similar to the present study. The reason behind more number of children found being malnourished who were breastfed for the period of 6 to 12 months and for more than 12 months was that proper complementary feeding was not initiated after the age of 6 months. Anita Khokhar and S. Singh (2003) [21] in their study also found similar results that the prevalence of malnutrition was high in children weaning early (64.8%) as

compared to children breast feed exclusively up to six months (35.2%). S. N. Dwivedi et al (1992) [22] in their study found that immunized children experience less malnutrition (57.0%) in comparison to unimmunized children (66.40%).

Conclusion:

Protein energy malnutrition in the form of underweight was present in more than one third children, while some children suffered from severe underweight. Prevalence of malnutrition was somewhat higher in female children than in male children. Prevalence of malnutrition was highest in the age group of 5 to 6 years and lowest in the age group of 4 to 5 years. Children who did not consume calories as per Recommended Daily Allowance (RDA) for their age showed higher prevalence of malnutrition in comparison to those children who were consuming calories as per RDA. Prevalence of malnutrition was more in children belonging to social class I, belonging to nuclear families, who dwelled in overcrowded houses, whose mother were illiterate or of mothers who were labourer and engaged in agricultural work. Higher prevalence of malnutrition was found in children who had birth weight of less than 2.5 kilograms, having interpregnancy interval of less than 24 months, of birth order of 4 or more, who were breastfed for a period of 6 to 12 months, to whom complementary feeding was started before the age of 6 months or who were partially immunized.

Recommendations:

Maternal education is positively related with child rearing practices and utilization of child health services. So, female literacy should be improved for promotion of child health, prevention of malnutrition and associated morbidities and better utilization of services. Mothers should be counselled regarding young child feeding practices like importance of colostrums, initiation of breast feeding, exclusive breast feeding during antenatal period. Nutritional education and time to time counselling of mothers should be done regarding initiation of complementary feeding and also the quality and quantity of food that can be given after six months of age. Health care providers like anganwadi workers, ASHA and Female Health Workers need to be sensitized time to time about infant and young child feeding. Immunization protects against common vaccine preventable diseases and also has protective effects over stunting. Routine immunization coverage should be maintained at high level and services need to be strengthened. Regular growth monitoring of each and every child by trained and qualified health care providers is very essential for early detection in growth faltering. Monitoring activities for situation of malnutrition and factors responsible for it at local levels should be strengthened and supervised.

Declaration:

Funding : Nil

Conflict of Interest : Nil

References:

1. K. R. G. Nair. Malnourishment among Children in India: A Regional Analysis. Economic and Political Weekly. 2007 September; 42(37): p. 3797-3803.

2. David Briggs. Making a Difference:Indicators to Improve Children's. Imperial College London, Department of Epidemiology and Public Health; 2003.

3. Assessing Child Malnutrition- Some Basic Issues(Sachdev).pdf [Internet]. Google Docs. [cited 2019 Aug 27]. Available from: https://drive.google.com/file/d/1teO5FJAV93Ex3OC_SSOF4o PoCVFrh4Sw/view?usp=sharing&usp=embed_facebook

4. Bishnoi P, Sehgal S, Kwatra A, Chernysheva T, Gerasimenko T, Apukhtina T. Anthropometric measurements of preschool children as effected by socio-economic factors. :1.

5. Sen PK. Nutritional status of under five children in an urban slum community of Calcutta. Indian J Public Health. 1994 Sep; 38 (3) : 113–4.

6. De Onis M, Monteiro C, Akré J, Clugston GA. The Worldwide magnitude of protein-energy malnutrition : an overview from the WHO Global Database on Child Growth. Bulletin of the World Health Organization 1993 ; 71(6) : 703-712 [Internet]. 1993 [cited 2019 Aug 27]; Available from: "https:// apps.who.int/iris/handle/10665/51422"https://apps.who.in t/iris/handle/10665/51422

7. Bellamy C. The State Of The World's Children. United Nations Children's Fund (UNICEF), Executive Director; 1998.

8. A. Kumar et al. Nutritional status assessment of under-five beneficiaries of Integrated Child Development Services

program in rural Karnataka. Australian Medical Journal. 2010; 3(8): p. 495-498.

9.   Malnutrition: a South Asian enigma. | POPLINE.org [Internet]. [cited 2019 Aug 27]. Available from: HYPERLINK "https://www.popline.org/node/274083" https://www.popline.org/node/274083

10. Tessa Wardlaw et al. Low Birthweight : Country, Regional and Global estmates. United Nations Children's Fund (UNICEF) and World Health Organization (WHO); 2004.

11. M. De Onis. Measuring nutritional status in relation to mortality. Bulletin of the WHO. 2000: p. 1271-1274.

12. Malnutrition [Internet]. [cited 2019 Aug 27]. Available from: HYPERLINK "https://www.who.int/news-room/fact-sheets/detail/malnutrition" https://www.who.int/news-room/fact-sheets/detail/malnutrition

13. National Family Health Survey 4 - India Fact Sheet. Mumbai: International Institute for Population Sciences, Ministry of Health and Family Welfare, Government of India; 2015-2016.

14. National Family Health Survey 4 - Jamnagar District Fact Sheet. Mumbai: International Institute for Population Sciences, Ministry of Health and Family Welfare, Government of India; 2015-2016.

15. National Family Health Survey (NFHS-4) 2015-16. Deonar, Mumbai 400088: International Institute for Population Sciences; December 2017.

16. Mahendraker et al. A study of medico social profile of under five children suffering from diarrhoeal disease. Indian Journal Maternal and Child Health. 1991; 2(4): p. 127-130.

17. A. Mittal et al. Effect of Maternal Factors on Nutritional Status of 1-5-Year-Old Children in Urban Slum Population. Indian Journal of Community Medicine. 2007 October; 32(4): p. 264-267.

18. M. Shafiqur Rahman et al. Association of Low-Birth Weight with Malnutrition in Children under Five Years in Bangladesh: Do Mother's Education, Socio- Economic Status, and Birth Interval Matter? PLOS ONE. 2016 June; 10.

19. Jyothi Lakshmi A et al. Nutritional status of rural preschool children - mediating factors. The Journal of Family Welfare. 2003 December; 49(2): p. 45-56.

20. Victora CG et al. Is prolonged breast-feeding associated with malnutrition? American Journal of Clinical Nutrition. 1984 February; 39(2): p. 307-314.

21. Anita Khokhar et al. A study of malnutrition among children aged 6 months to 2 years from a resettlement colony Delhi, Department of community medicine, VVCM & Safadarjang Hospital. Indian Journal of Medical Sciences. 2003; 57(7): p. 286-289.

22. S. N. Dwivedi et al. Malnutrition among the children in an urban Indian slum and its associations. Indian Journal of Maternal and Child Health. 1992 July-September; 3(3): p. 79-81.

Prevalence of Internet Addiction among College students of Ahmedabad city

Donald S. Christian[1], Bhavik Rana[1], Jayshree Tolani[2], K. N. Sonaliya[3]

[1]Associate Professor, [2]Statistician cum Tutor, [3]Professor and Head, Community Medicine Department,

GCS Medical College Hospital & Research Centre, Ahmedabad, Gujarat, India

Correspondence : Dr. Bhavik Rana, E mail: dr.bhavikrana@hotmail.com

Abstract :

Introduction: With increased access to the cheaper and faster internet, the people are more prone to develop addiction to the internet. This internet addiction may interfere with essential activities like acquiring formal education. Therefore it is important to assess the level of internet addiction and associated factors with the same amongst students. **Objectives :** To know the prevalence of internet usage among college students of various fields, to assess the patterns and risk factors of internet usage among the students and to evaluate internet addiction and behavior issues related to internet use. **Method:** The study was a cross-sectional study, which was carried out in five different colleges across different streams (Medicine, Arts, Commerce, Science and Law) in the city of Ahmedabad during the period of October 2017 to November 2018. The sample size was 465 students. Young's Internet Addiction Test (IAT) was utilized to assess the internet addiction amongst the study participants. **Results :** The study revealed that the overall prevalence of internet addiction was 56.8% which included 17.4% moderate and 1.3% of severe addiction. Highest prevalence was found in the students from commerce stream. The factors which were found significantly associated were;average length of internet use (highest with use of 7 to 10 years), average daily use of internet (highest with daily use of 11 hours or more), and continuous access to the internet. **Conclusion :** Majority of the students had some form of internet addiction in the present study. Duration of internet use, daily time spent on internet and continuous access to the internet were among the major attributes associated with internet addiction among college students.

Key Words : Addiction, Prevalence,Young's Internet Addiction Test

Introduction :

Internet has become a major innovation of the 21st century as it not only is a tool for communication but also an apparatus of entertainment, knowledge seeking and information-sharing. The ease of access to the rest of the world has made significant impact on the lives of people so much that it initially became a habit and then to the form of an addiction. With the passage of time, attractive features including social networking have led to Internet addictive behavior in their frequent users. [1] This behavior has not spared anyone irrespective of the social status of the individual especially after the invention of gadgets like smart-phones and tablets. The internet with its newer and newer gadgets threatens significant behavior problems.[2] Moreover, even among the academicians and students; this "unnoticed" addiction to the internet usage could not be denied.

Of the total population of around 1.2 billion (2011), the number of Internet users (both urban and rural) in India is around 205 million and India will be the second-leading country after China (currently internet users of around 300 million).[3] Internet addiction commonly refers to an individual's inability to control his or her use of the internet (including any online-related, compulsive behavior), which eventually causes one's marked distress and functional impairment in daily life.[4]Internet addiction, especially among adolescence and young adults would usher to poor academic performance (disturbed time management), changes in sleeping and dietary patterns, impaired cognition and increased risk taking behaviours. [5] College students are especially vulnerable to developing dependence on the Internet. Time availability; ease of access to the internet; the psychological and developmental characteristics of youth; limited supervision; internet dependent learning etc are some of the factors which

foster the continuous use of internet among the young adults. [6] As per DSM-V(The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition), Internet addiction is presently being considered as an area in need of research as it is not yet been classified as a disorder per se.[7] Several previous studies done so far have just explained the nature of addiction for internet in an explanatory manner. Further, most of those studies had not utilized consistent criteria for identifying internet addiction.[8] The disparities in the use of diagnostic criteria has invariably made it impossible to establish the prevalence of Internet addiction.[9] Young's Internet Addiction Test (IAT) developed by Dr. Kimberly Young was used for measuring internet addiction as the test carries good content validity.[10] In this respect, a study would be worth using such a valid test questionnaire to know the patterns, prevalence, and risk factors for internet addiction among college students of Ahmedabad city.

Objectives:

- To know the prevalence of internet usage among college students of various fields

- To assess the patterns and risk factors of internet usage among the students

- To evaluate internet addiction and behavior issues related to internet use.

Method:

This was a cross-sectional study carried out in five different colleges across different streams (Medicine, Arts, Commerce, Science and Law) in the city of Ahmedabad during the period of from October 2017 to November 2018. The study was conducted among graduate students only. College approval and written informed consent were obtained for all students who participated. The study sought permission from institutional ethics committee before data collection. The sample size (N=400) was calculated for an assumed prevalence of Internet addiction being 50% (as the exact measure from studies using a similar rating scale was unavailable) with 95% confidence interval and 10% absolute precision of the estimate. The formula utilized to calculate sample size (N) is as followed: $N = 4 \times p \times q / L^2$, where p = prevalence of

internet addiction = 0.5 (assumed as 50% for this study), q = 1-p, and L = Maximum allowable error (10% of p).

Sample selection

The present study was conducted at different colleges located at Ahmedabad city. A total of five colleges from five different streams (Medicine, Arts, Commerce, Science and Law) were selected from different zones of Ahmedabad. The selection of colleges was by convenient sampling and according to the due permissions from the concerned authority.

Young's Internet Addiction Test (IAT), developed for screening and measuring levels of Internet addiction was used an instrument for data collection by the investigator faculties. The items of the IAT, each rated from 1 (rarely) to 5 (always), include compulsive behavior related to use of the Internet, the occupational or academic difficulties, lack of competence at home, problems in interpersonal relations, and emotional problems. The test has good internal consistency reliability as well as concurrent validity.[10]

Data collection and measures of Internet addiction

The questionnaire contained the following parts: Socio-demographic information, Details regarding patterns of internet use andYoung's Internet Addiction Test (IAT). The questionnaires were distributed to the college students through Google forms with help of college administrators. The questionnaires were anonymous and self-administered. The higher the score range for IAT, thegreater the level of addiction; normal range: 0-30 points, mild: 31-49 points, moderate: 50-79 points, and severe:80-100 points. A score of more than 30 points was considered as having internet addiction (mild, moderate or severe). The excellent psychometric properties of the questionnaire are well-documented in the literature.[11] The Epi Info Version 7.2 was used for statistical analysis of the data collected. Descriptive statistics was used to examine the association of factors of the questionnaire with Internet addiction.

Table 1 : Socio-demographic profile of the study sample (n = 465)

Characteristics	Frequency	Percentage
Professional stream		
Arts	94	20.2
Commerce	91	19.6
Law/Education	92	19.8
Medicine	98	21.1
Science	90	19.4
Age Group (Completed Years)		
17-20	285	61.3
21-25	150	32.3
26-30	20	4.3
31 and more	10	2.2
Gender		
Female	210	45.2
Male	255	54.8
Place of stay during study		
Home	264	56.8
Hostel	201	43.2
Father's Occupation		
Business	189	40.6
Govt. Service	54	11.6
Private Service	126	27.1
Others	96	20.6
Mother's Occupation		
Business	30	6.5
Govt. Service	36	7.7
Housewife	345	74.2
Private Service	39	8.4
Others	15	3.2

Table 2: Internet use amongst study participants

Characteristics	Frequency	Percentage
Duration of use of internet		
1-3 years	162	34.8
4-6 years	180	38.7
7-10 years	78	16.8
11-14 years	27	5.8
15 years and more	18	3.9
Daily use of internet		
0-3 hours	213	45.8
4-6 hours	195	41.9
7-10 hours	45	9.7
11 hours and more	12	2.6
Commonest place of use		
College	30	6.5
Cyber Cafe	6	1.3
Residence	357	76.8
Library/Lab	12	2.6
Others (during public transportation, outdoor activities etc.)	60	12.9
Most common gadget for Internet Usage		
Mobile phone	432	92.9
Desktop	12	2.6
Laptop	12	2.6
Tablet	9	1.9
Access to internet		
Always "On"	105	22.6
Can't say	135	29.0
Intermittently "On"	225	48.4
Commonest mode of internet access		
Broadband	12	2.6
Mobile Data	369	79.4
WiFi	81	17.4
Others	3	6

Table 1 shows that maximum students were from medical field (21.1%) followed by arts (20.2%) field. Most of the students were in the age group of 17-20 years. About 2.2% students were more than 30 years of age (due to repeated failures or admission at later ages). About 54.8% males and 45.2% females participated in the current study. Upon investigating about the fathers' occupation, it was found that majority of them were businessmen. Similarly, mothers of majority of students were housewives.

Table 2 demonstrates that majority (38.7%) of students were using internet for 4 to 6 years. It is to be noted here that some students from Arts and Law streams had a higher age than an otherwise average age for the same streams. A total of 18 (3.9%) studentswere using internet for more than 15 years. Most of the students had restricted their daily internet usage to 3 hours (45.8%). The commonest place for internet usage was found to be their residence amongst most of the students (76.8%). Almost 93% of the students were using internet by mobile phones. About 22.6% of the students were accessing internet without any interruption, while majority of the students (48.4%) had intermittent access to the internet. Mobile data was found to be most common source of internet amongst study participants (79.4%), which was followed by WiFi (17.4%).

Table 3 : Internet Addiction Test score

Level of Internet Addiction	Frequency	Percentage
0-30 (Normal)	201	43.2
31 - 49 (Mild)	177	38.1
50 - 79 (Moderate)	81	17.4
80 - 100 (Severe)	6	1.3
Total	465	100.0

As illustrated in table 3, about 43.2% of the students were normal (or had minimal risk of internet addiction) while rest (56.8%) of the study participants had some level of internet addiction according to Young's Internet Addiction Test.

Associations were sought between various socio demographic factors and internet addiction, which are depicted in table 4. However, none of the factor was found to be significantly associated with internet addiction. Higher internet addiction was found amongst males (60.0%), age group of 30-39 years (100.0%) and in students of commerce stream (62.6%).

(Table 5) It was found that the length of use of internet was significantly associated with internet addiction (p=0.011). Maximum (69.2%) prevalence was found amongst those who had been using internet for 15 years and mores from the date of survey. Average daily use of internet (Hours) was also found to be associated with internet addiction (p<0.005). It was observed that the prevalence of internet addiction was higher amongst those who used internet daily for 11 hours or more duration. One more factor which was found to be significantly associated with internet addiction was "access to internet" (p<0.005). Highest prevalence of internet addiction was amongst those who always had access to the internet (82.9%).

Discussion:

In the present study, the prevalence of internet addiction was found to be 56.8 % and no addiction was found among 43.2% users (Table 3). Similar rate for internet addiction (54%) was found among college students of Tunisia where 556 students were surveyed using the same questionnaire.[12] In the present study, males (60%, n=153/255) were more likely to be addicted to internet than females (52.9%, n=111/210), though it was not significant. Some studies have also shown that males are more sensitive to have internet addiction. [13] This higher proportion for male students also supports the findings by a study done in Madhya Pradesh with 391 students where the proportions of male students aged 15-25 years was 55%.[14] There are few other recent international studies which say the higher internet addiction among male students than the female counterpart.[15-17] However, the daily usage of among female students has gone up significantly in recent years. In the present study, there was no significant difference between internet addiction and the type of stream the students are enrolled in.

Table 4: Association between socio-demographic factors and internet addiction

Characteristics	Non-addicted	Addicted	χ^2 value	p Value
Gender				
Female	99 (47.1)	111 (52.9)	2.394	0.122
Male	102 (40.0)	153 (60.0)		
Age Group				
0-19	45 (40.5)	66 (59.5)	3.979*	0.264
20-29	153 (44.5)	191 (55.5)		
30-39	0 (0.0)	6 (100.0)		
50 or more	3 (75.0)	1 (25.0)		
Place of Stay				
Home	114 (43.2)	150 (56.8)	0.000	1.000
Hostel	87 (43.3)	114 (56.7)		
Stream of Study				
Arts	40 (42.6)	54 (57.4)	3.604	0.462
Commerce	34 (37.4)	57 (62.6)		
Law	39 (42.4)	53 (57.6)		
Medicine	42 (42.9)	56 (57.1)		
Science	46 (51.1)	44 (48.9)		

*Chi-square with Yate's Correction

Among the subjects having internet addiction, 38.1% had mild addiction, 17.8% had severe addiction and 1.4% had severe internet addiction at the time of interview. In a study by Sharma B et al with 1304 college students using Young's Internet Addiction Test, the prevalence of mild , moderate and severe addiction were found to be 27.8%, 15.8 % and 1.3% respectively.[15] The higher proportions of addiction in current study might be due to a smaller sample size. There was no significant association between internet addiction and usual place for its use in the current study. This finding is different from a study done by Paul et al where the students staying at home were more likely to have addiction to the internet.[18] In the present study, the duration of internet usage since its inception was significantly associated with addiction, as majority of the initial users (n=87, 53.7%) were found to be addicted to

Table 5: Association of Internet use related factors and internet addiction

Characteristics	Non-addicted	Addicted	χ^2 value	p Value
Average length of use of internet (Years)				
1-3	75 (46.3)	87 (53.7)		
4-6	90 (50.0)	90 (50.0)		
7-10	24 (30.8)	54 (69.2)	12.896*	0.011
11-14	9 (33.3)	18 (66.7)		
15 Years and more	3 (16.7)	15 (83.3)		
Average daily use of internet (Hours)				
0-3	120 (56.3)	93 (43.7)		
4-6	66 (33.8)	129 (66.2)		
7-10	12 (26.7)	33 (73.3)	28.565	0.000
11 or more	3 (25.0)	9 (75.0)		
Commonest place of use of internet				
College	15 (50.0)	15 (50.0)		
Cyber Cafe	3 (50.0)	3 (50.0)		
Home	147 (41.2)	210 (58.8)	1.751*	0.7814
Library/Laboratory	6 (50.0)	6 (50.0)		
Others	30 (50.0)	30 (50.0)		
Most common gadget for internet use				
Mobile Phone	186 (43.1)	246 (56.9)		
Desktop	6 (50.0)	6 (50.0)		
Laptop	6 (50.0)	6 (50.0)	0.136*	0.987
Tablet	3 (33.3)	6 (66.7)		
Access to Internet				
Always	18 (17.1)	87 (82.9)		
Sometimes	117 (52.0)	108 (48.0)	37.93	0.000

* Chi-square with Yate's Correction

internet (Table 6). This coincides with the findings by Kraut et al, where he found that "new users" are more likely to be negatively affected as far as psychological addiction is concerned.[19]

There was a significant statistical association between average internet usage per day and internet addiction among the respondents. In the current study, the proportions of addiction was found to be 47.74% (n=222) for those who spent an average duration of only 0-6 hours per day. Similar findings were observed by Krishnamurthy and Kumar in a study conducted at Bengaluru city where 43% of the college students from different streams showed the mild and moderate addiction.[20] There was a significant association between the usual status "always logged in" and the internet addiction. According to one research, this type of pathological users is more likely to be socially withdrawn and would affect learning in such productive and decisive college times.[21]

Conclusion:

The study revealed that the overall prevalence of internet addiction was 56.8% which included 17.4% moderate and 1.3% of severe addiction. Highest prevalence was found in the students from commerce stream. The factors which were found significantly associated were; average length of internet use (highest with use of 15 years or more), average daily use of internet (highest with daily use of 11 hours or more), and continuous access to the internet.

Recommendations:

Awareness regarding Cell-phone etiquettes, including length of time spent on internet usage per day should be spread among college students. The concept of daily "Net free hours" should be introduced in the daily routines of the students.

Declaration:

Funding: Nil

Conflict of Interest: None.

References:

1. Kuss DJ, Griffiths MD. Online social networking andaddiction — A review of the psychological literature. Int J Environ Res Public Health 2011;8:3528-52.

2. Christakis DA. Internet addiction: A 21 st century epidemic?BMC Med 2010;8:61.

3. Internet and Mobile Association of India. Internet Users in India Crosses 200 Million Mark. New Delhi: Internet and Mobile Association of India (IMAI); 2013.

4. Daniel T, Shek L, Rachel C, Sun F, Lu YU. Neuroscience in the 21st Century from Basic to Clinical. 2nded. New York: Springer Science+Business Media LLC; 2013.

5. Pfaff D, Volkow N. Neuroscience in the 21st century. 2nd ed. New York, USA: Springer;2013;15031-564

6. Kandell JJ. Internet addiction on campus: The vulnerability of college student. Cyber psycho Behav 1998;1:11-7.

7. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 5th ed. Arlington, VA: American Psychiatric Publishing; 2013. p. 796.

8. Byun S, Ruffini C, Mills JE, Douglas AC, Niang M, Stepchenkova S, et al. Internet addiction: Metasynthesis of 1996-2006 quantitative research. Cyberpsychol Behav2009;12:203-7.

9. Spada MM. An overview of problematic internet use. AddictBehav 2014;39:3-6.

10. Young KS. Caught in the Net: How to Recognize the Signs of Internet Addiction--and a Winning Strategy for Recovery. New York, NY, USA: John Wiley and Sons, Inc.; 1998.

11. Mellouli M, Zammit N, Limam M, Elghardallou M, Mtiraoui A, Ajmi Tand ZediniC.Prevalence and Predictors of Internet Addiction among College Students in Sousse, Tunisia, J Res Health Sci. 2018 Jan 2;18(1):e00403.

12. Ngai SS. Exploring the validity of the internet addiction test for students in grades 5-9 in Hong Kong. Int J Adolesc Youth, 2007;13:221-37.

13. Zhou Xiaoyan, XuFeng, Wei Xiaoli, Internet Addiction Disorder and Mental Health in the University Students in Yan'an City, China Journal of Health Psychology, 2015, 23(10); 1506-9.

14. Sharma A, Sahu R, Kasar PK, Sharma R. Internet addictionamong professional courses students: A study from central India. Int J Med Sci Public Health 2014; 3:1069-73.

15. Jang KS, Hwang SY, Choi JY, Internet addiction and psychiatric symptoms among Korean adolescents, J Sch Health. 2008 Mar;78(3):165-71. doi: 10.1111/j.1746-1561.2007.00279.

16. Sahin C. An analysis of internet addiction levels of individualsaccording to various variables. Turk Online J EducTechnol2011; 10:60-6.

17. Sharma B, Ashok L, Chandrasekaran V, Monteiro A. Internet addiction and its correlates among undergraduate college students in UdupiTaluk, Karnataka. J DattaMegheInst Med SciUniv 2018;13:95-9.

18. Paul AV, Ganapthi RC, Duraimurugan K, Abirami M, Elizabeth Reji V. Internet addiction and associated factors, a study among college students in South India. Innov J Med Health Sci 2015;5:121-5.

19. Kraut R, Kiesler S, Boneva B, Cummings J, Helgeson V, Crawforda A. Internet paradox revisited. J Soc Issues 2002; 58:49-74.

20. Krishnamurthy S, Chetlapalli SK. Internet addiction: Prevalence and risk factors: A cross-sectional study among college students in Bengaluru, the Silicon Valley of India. Indian J Public Health 2015; 59:115-21.

21. Morahan-Martin J, Schumacher P, Incidence and correlates of pathological Internet use among college students, Computers in Human Behavior, Volume 16, Issue 1, 31 January 2000, 13-29.

Knowledge, Sociocultural Believes & Practices about Menstruation among Medical & Paramedical Students of T.S.Misra Medical College & Hospital, Lucknow

Lokesh Agarwal[1] , Sumit Saxena[2] , Anchal Negi[3]

[1]Professor & Head, [2]Associate Professor, Department of Community Medicine, [3]MBBS Student, T. S. Misra Medical College & Hospital, Lucknow, Uttar Pradesh, India

Correspondence : Dr. Sumit Saxena, E mail: drsumitsaxena22@gmail.com

Abstract :

   Introduction: Menstruation hygiene is an issue that every girl and women has to deal with in her life but there is lack of awareness on the process of menstruation. The manner in which a girl learns about menstruation and its associated changes may have an impact on her response to the event of menarche. The taboos and socio-cultural practices related to menstruation, such as not being allowed to visit holy places and entering the kitchen among others restrictions makes them feel socially ostracised. **Method :** The present descriptive cross-sectional study was conducted at T.S. Misra Medical College & Hospital Lucknow under the guidance of Community Medicine department. The study population comprised of girls studying in MBBS & Paramedical courses. Total 147 MBBS students & 52 paramedical students were interviewed. The methodology comprised of face-to-face interview with students in the institute premises at a private place provided by the institute. **Result :** The average length of menstrual cycle is 28-32 days was established by 78(53.0%) MBBS students & 11(21.1%) paramedical students. "Uterus is the main source of bleeding" was the response given by 145(98.6%) MBBS & 22(42.3%) paramedical students. More than half 107 (72.8%) MBBS students & 35 (67.3%) thought that menstrual blood is impure blood. According to 49(33.3%) MBBS students & 21 (40.4%) paramedical girls holy places cannot be visited during menstruation. **Conclusion :** Overall, menstrual knowledge (bleeding days, source of blood, material used during periods) & practices (using sanitary pads & its dispose method) are better in the MBBS students as compared to paramedical students.. Still, there is need for sensitizing the girls and increasing their knowledge towards menstrual practices. An integrated menstrual education program should emphasize the physiological basis of menstruation.

Key Words : Believe, Menstruation, Sociocultural

Introduction :

   The term adolescence comes from Latin word meaning "to grow to maturity". W.H.O. has defined adolescence as a period between 10-19 years.[1] Adolescence in girls has been recognized as a special period which signifies the transition from girlhood to womanhood. Globally, adolescent girls constitute about 1/5th of total female population. While in India, adolescent girls account for a little more than one-fifth of the population (21.4%).[2] By year 2025, the population of adolescents in developed and developing countries would be around 19% and 27% respectively.[3]

   Menstruation hygiene is an issue that every girl and women has to deal with in her life but there is lack of awareness on the process of menstruation. The first menstruation also called as "MENARCHE". Menarche marks the beginning of a multitude of physical, physiological, and psychological changes in the lives of the adolescent girls.

   Menarche is the most important event in the life of an adolescent girl. During puberty, hormonal, psychological, cognitive and physical changes occur simultaneously and interactively making physiological development a challenge adolescents have to face, with emotional, social and behavioural dimensions. More than just a physiological process, menstruation may be looked on as a restriction on women's religious and social traditions or as a taboo.[4]

Menstruation is still regarded something unclean or dirty in Indian society. The reaction to menstruation depends upon awareness and knowledge about the subject. The manner in which a girl learns about menstruation and its associated changes may have an impact on her response to the event of menarche. Although menstruation is a natural process it is linked with several misconceptions and practices, which sometimes result into adverse health outcomes.

For most girls, menarche is a negative, frightening experience, or, at the best, a nuisance, or is something to fear or to be ashamed of. The taboos and socio-cultural practices related to menstruation, such as not being allowed to visit holy places and entering the kitchen among others restrictions makes them feel socially ostracised.

Adolescents find themselves sandwiched between a glamorous western influence and a stern conservatism at home, which strictly forbids discussion on sex and our traditional society discourages open discussion on these issues. This dichotomy aggravates the confusion among adolescents. This has led to increase in pre-marital sexual activity, pregnancy among unmarried girls apart from the increasing incidence of abortion and STDs. Sexually Transmitted Infections (STI's), including HIV (Human Immunodeficiency Virus) mainly affects sexually active young people.[5]

Several studies documented that menstruation related problems, had affected more than a third of student's class concentration, participation, socializing with friends, test taking skills and homework task performance. Dysmenorrhea was significantly associated with school absenteeism and decreased academic performance, sports participation, and socialization with peers.[6]

Majority of studies were conducted among the adolescent school girls of different population. Most of the time adolescent girls are unprepared in terms of knowledge, skill and attitude for managing the menstrual cycle. Therefore, increased knowledge about menstruation right from childhood may escalate practices and may help in mitigating the suffering of millions of women. Education has been described as a 'social vaccine', and it can serve as a powerful preventive tool. With this in mind, the present study was carried out to gather information about menstruation, hygiene related practices and socio-cultural believes regarding menstruation among medical & paramedical students of T.S. Misra Medical College & Hospital, Lucknow.

Objectives :

- To study the knowledge and socio cultural beliefs prevalent in the context of menstruation among medical & paramedical students

- To assess the menstrual hygiene practices among medical & para- medical students

Method :

The present descriptive cross-sectional study was conducted at T.S. Misra Medical College & Hospital Lucknow under the guidance of Community Medicine department. The study was conducted over a period of three months i.e. from 1st June 2018 to 30th August 2018. The study population comprised of girls studying in MBBS & Paramedical institute of T.S. Misra Medical College & Hospital Lucknow.

Sample Size : Total 147 MBBS students & 52 paramedical students were interviewed. Total 149 students interviewed.

Inclusion Criteria :

- Studying in MBBS & Paramedical institute only.

- Willing to participate

Exclusion Criteria :

- Not present in institute for maximum of three consecutive visits.

Study Tool : An instrument for the survey was developed after reviewing the available literature. A pilot study was conducted initially at five medical & five paramedical students of T.S Misra Medical College & Hospital, Lucknow to see the feasibility of the study and for validation of the study tool. Difficulties in data collection and ambiguities in the questionnaire were resolved and modifications were done in the study instrument as indicated by the pilot study.

Selection of study subjects: First of all, permission was sought from the principal of the institute both Medical & Paramedical College. From

each institute, a complete roll number list of all students was obtained. After obtaining the roll-number, every student was explained the purpose of study and voluntary informed consent taken. Face to face interview conducted with the MBBS & Paramedical students.

Methodology : Interview was made to each student and information about the purpose of study was given to all study subjects. Rapport was developed and voluntary informed consent was taken before filling the pre-designed, pre-tested semi-structured questionnaire. The methodology comprised of face-to-face interview with adolescent girls in the institute premises at a private place provided by the institute. The girls were picked randomly, one at a time, from the roll

number list of respective classes using random number table. If any girl was found absent on the day of interview, maximum of two more attempts were made to contact the girl and interview her in subsequent visits and even if found absent on two consecutive visits, then that girl was excluded from the study. After completion of the interview or in case of non-availability or exclusion, next girl was chosen similarly from the roll number list using random number table. In the end, after the completion of all interviews, the girls were collected & given health education and counselled in areas where their knowledge was lacking and needed reinforcement by the author of the study.

Figure 1: Study Protocol
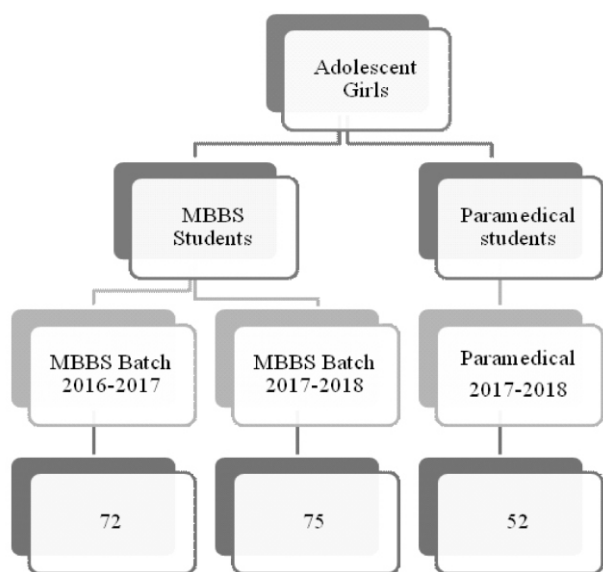
Statistical Analysis: Data were entered using Microsoft Excel 2010 and statistical analysis was done using IBM SPSS v 20.0.0. Categorical variables were analysed using proportions and percentages.

Results :

Predominantly the girls belonged to age group of 18-22 years 92 (62.5%) in MBBS & 30(57.6%) in paramedical, more than half girls are Hindu by religion in both group. 120 (81.6%) MBBS & 32 (61.5%) paramedical girls are residing in hostel. Around 100(68.0%) MBBS girls belong to upper class I & 26 (50.0%) paramedical girls belong to middle class III according to B.G. Prasad socio-economic status. (Table 1)

All participated girls had attained menarche. Mostly girls 68(46.2%) MBBS girls & 28(53.8%) paramedical girls had their menarche at the age group of 13 years. Very few subjects 12(8.1%) MBBS girls & 7(13.5%) paramedical girls had the onset of menstruation before $\leqslant$ 11 years. Mean age of Menarche was 13.0±1.03 years in MBBS students & 12.8 ±1.07 years in Paramedical students. (Table 2)

While collecting the information regarding knowledge about menstruation, 128(87.0%) MBBS & 18(34.6%) paramedical students replied that bleeding occurs 4-5 days during period. The average length of menstrual cycle is 28-32 days was established by 78(53.0%) MBBS students & 11(21.1%) paramedical students. Uterus is the main source of bleeding by 145(98.6%) MBBS & 22(42.3%) paramedical students. Obtaining the information about sanitary pad 88(59.8%) MBBS girls & 11(21.1%) paramedical students replied that one should change the pad three times a day. Regarding material used during menstruation, more than half 120(81.6%) MBBS students & 38(73.0%) paramedical students replied sanitary pad only. (Table 3)

Sociocultural believes towards menses : Around 122 (83.0%) MBBS students & 40(76.9%) paramedical girls were believed that girl should take bath during periods. More than half 107 (72.8%) MBBS & 35 (67.3%) paramedical students thought that menstrual blood is impure blood. According to 49(33.3%) MBBS students & 21 (40.4%) paramedical girls holy places cannot be visited during

Table 1: Demographic characteristics of Medical & Paramedical students

Biosocial Characteristics	Medical Students(n=147)	Para-medical Students(n=52)
Age (years)		
18-22	92(62.5%)	30(57.6%)
21-23	50(34.0%)	13(25.0%)
24-26	05(3.4%)	09(17.3%)
Religion		
Hindu	106(72.1%)	40(76.9%)
Muslim	22(15.0%)	08(15.4%)
Sikh	12(8.2%)	03(5.8%)
Others	07(4.8%)	01(1.9%)
Caste		
General	111(75.5%)	19(36.5%)
OBC	25(17.0%)	28(53.8%)
Others	11(7.5%)	05(9.6%)
Residence		
Hostel	120(81.6%)	32(61.5%)
Home with Family	25(17.0%)	13(25.0%)
With Relatives	2(1.4%)	7(13.5%)
Type of Family		
Nuclear	115(78.2%)	25(48.1%)
Joint	29(19.7%)	27(51.9%)
Extended	3(2.0%)	0
Education of Mother		
Illiterate	1(0.7%)	1(1.9%)
Can Read only	0	3(5.8%)
Primary	01(0.7%)	01(1.9%)
Middle	0	9(17.3%)
High-school	17(11.6%)	18(34.6%)
Graduate and Above	128(87.1%)	20(38.5%)
Education of Father		
High-school	06(4.1%)	14(26.9%)
Graduate and Above	141(95.9%)	38(73.1%)
Socioeconomic Status		
I (Upper class)	100(68.0%)	04(7.7%)
II (Upper Middle)	39(26.5%)	08(15.4%)
III (Middle class)	8(5.4%)	26(50.0%)
IV(Lower Middle)	0	14(26.9%)

Table 2: Distribution of students according to Menarche

Attained Menarche		MBBS students	Paramedical Students
Have you started your menstruation	**Yes**	147(100.0%)	52(100.0%)
At What Age (Years)			
≤11		12(8.1%)	7(13.5%)
12		26(17.7%)	8(15.4%)
13		68(46.2%)	28(53.8%)
14		27(18.4%)	4(7.6%)
15		14(9.5%)	5(9.6%)

Table 3: Knowledge about Menstruation among MBBS & Paramedical students

Knowledge about menstruation	MBBS Student n=147	Paramedical Student n=52	Chi-square Test
For how many days bleeding occurs during a period			
Correct (4-5 days)	128(87.0%)	18(34.6%)	χ^2=54.0 df=1 p value=0.00
Incorrect	19 (12.9%)	34 (65.4%)	
Average Length of cycle			
Correct (28-32 days)	78(53.0%)	11(21.1%)	χ^2=15.81 df=1 p value=0.00
Incorrect	69 (46.9%)	41(78.8%)	
Source of blood in the body during periods			
Correct (Uterus)	145(98.6%)	22(42.3%)	χ^2=90.32 df=1 p value=0.00
Incorrect	2(1.3%)	30(57.6%)	
How many times in a day one should change a pad			
Correct (Three times)	88(59.8%)	11(21.1%)	χ^2=23.02 df=1 p value=0.00
Incorrect	59(40.1%)	41(78.8%)	
Material can be used during periods			
Sanitary pad alone	120(81.6%)	38(73.0%)	χ^2=1.71 df=1 p value=0.18
Cloth	27(18.3%)	14(26.9%)	

Table 4: Sociocultural Believes of Adolescent girls regarding Menstruation

Sociocultural Believes	Response	MBBS Student n=147	Paramedical Student n=52	Chi-square test
Do you think a girl should take bath during period ?	Yes	122(83.0%)	40(76.9%)	χ^2=1.329 df=2 p value=0.514
	No	13(8.8%)	05(9.6%)	
	Don't Know	12(8.2%)	07(13.5%)	
Do you think menstrual blood is impure blood ?	Yes	107(72.8%)	35(67.3%)	χ^2=1.215 df=2 p value=0.544
	No	34(23.1%)	13(25.0%)	
	Don't Know	06(4.1%)	04(7.7%)	
Do you think holy places can be visited by girls during menstruation ?	Yes	82(55.8%)	27(51.9%)	χ^2=1.037 df=2 p value=0.595
	No	49(33.3%)	21(40.4%)	
	Don't Know	16(10.9%)	04(7.7%)	
Do you think females should not be allowed to enter kitchen during menstruation ?	Yes	63(42.9%)	15(28.8%)	χ^2=3.264 df=2 p value=0.195
	No	70(47.6%)	30(57.7%)	
	Don't Know	14(9.5%)	07(13.5%)	
Do you think girl should not carry out physical activities like cycling during menses ?	Yes	40(27.2%)	19(36.5%)	χ^2=1.692 df=2 pvalue=0.429
	No	90(61.2%)	27(51.9%)	
	Don't Know	17(11.6%)	06(11.5%)	
Do you think that poor menstrual hygiene predisposes to foul smelling ?	Yes	110(74.8%)	30(57.7%)	χ^2=6.341 df=2 p value=0.04
	No	26(17.7%)	13(25.0%)	
	Don't Know	11(7.5%)	09(17.3%)	
A girl should not carry out daily activities during menses	Yes	101(68.7%)	31(59.6%)	χ^2=1.87 df=2 p value=0.392
	No	30(20.4%)	12(23.1%)	
	Don't Know	16(10.9%)	09(17.3%)	
Do you think girl should avoid certain food during menses ?	Yes	45(30.6%)	42(80.7%)	χ^2=39.28 df=2 p value=0.00
	No	84(57.1%)	08(15.4%)	
	Don't Know	18(12.2%)	02(3.8%)	
What food should be avoided during menstruation	Cold beverages	10(22.2%)	07(16.6%)	χ^2=0.426 df=2 p value=0.808
	Salty food	12(26.6%)	12(28.5%)	
	Sour food	23(51.1%)	23(54.8%)	
Do you think it is necessary to give knowledge about menstruation to the girls ?	Yes	147(100.0%)	52(100.0%)	Not applicable

Table 5: Menstrual Hygiene practices among MBBS & Paramedical students

Menstrual Hygiene practices		MBBS Student n=147	Paramedical Student n=52	Chi-square Test
Type of material do you use during menstruation	Sanitary pad	120(81.6%)	38(73.1%)	$\chi^2=1.719$ df=1 p value=0.189
	Home made with cloth piece	27(18.4%)	14(26.9%)	
If you are using cloth do you reuse it	Yes	17(62.9%)	8(57.1%)	$\chi^2=0.131$ df=1 p value=0.717
	No	10(37.0%)	6(42.8%)	
What you do before reusing the same cloth ?	Wash with Soap and water and dry them under sun	7(41.1%)	2(25.0%)	$\chi^2=0.618$ df=1 p value=0.431
	Wash with Soap+ water+ antiseptic + Sun dried	10(58.8%)	6(75.0%)	
How many times do you change your pads/cloth per day ?	One time	35(23.8%)	11(21.2%)	$\chi^2=1.926$ df=3 p value=0.587
	Two times	67(45.5%)	21(40.4%)	
	Three times	34(23.1%)	13(25.0%)	
	More than three times	11(7.5%)	7(13.4%)	
How do you dispose your pads during menstruation ?	Bury the pads	0	1(2.6%)	Yates chi-square=0.371 df=1 p value=0.542
	Wrap the pad in paper and discard in emptied bin	120 (100.0%)	37(97.4%)	
Do you bath during menstruation ?	Everyday	97(66.0%)	30(57.7%)	$\chi^2=1.144$ df=1 p value=0.284
	Alternate day	50(34.0%)	22(42.3%)	
Do you wash your genitals during menstruation after changing pad every time ?	With water only	73(49.7%)	28(53.8%)	$\chi^2=0.269$ df=1 p value=0.604
	Water with soap	74(50.3%)	24(46.2%)	
Do you wash your hands during changing pads every time ?	Yes	147 (100.0%)	52 (100.0%)	Not applicable
If yes then with	With water only	39(26.5%)	13(25.0%)	$\chi^2=0.047$ df=1 p value=0.828
	Water with soap	108(73.5%)	39(75.0%)	
Do you face any problem in attending the institute during menstruation ?	Yes	59(40.1%)	27(51.9%)	$\chi^2=2.175$ df=1 p value=0.140
	No	88(59.8%)	25(48.1%)	
Do you change pads/cloth during institute hours ?	Yes	88(59.9%)	34(65.4%)	$\chi^2=0.494$ df=1 p value=0.482
	No	59(40.1%)	18(34.6%)	

menstruation. In modern era even 63 (42.9%) MBBS girls & 15 (28.8%) paramedical girls believed that females should not be allowed to enter kitchen during menses. 40 (27.2%) MBBS & 19 (36.5%) paramedical girls believed that girls should not carry out physical activities like cycling during menses. Belong to medical professions even 26(17.7%) MBBS girls & 13 (25.0%) paramedical girls did not believe that poor menstrual hygiene predisposes to foul smelling. Approximately 101 (68.7%) MBBS & 31 (59.6%) paramedical students believed that a girl should not carry out daily activities during menses. 45(30.6%) MBBS & 42(80.7%) paramedical girls thought that certain food should be avoided during menses. Mostly 23(51.1%) MBBS girls & 23(54.8%) paramedical girls avoiding sour food during menses. All MBBS & paramedical students agree that it is necessary to give knowledge about menstruation to the girls. (Table 4)

More than half 120(81.6%) MBBS and 38(73.1%) paramedical girls used sanitary pad during menses. 17(62.9%) MBBS and 8(57.1%) paramedical students were reusing the cloth during menses. Before, reused cloth was washed with soap, water, antiseptic and dried in Sun by 10 (58.8%) MBBS and 6 (75.0%) paramedical students only. Around 67(45.5%) MBBS students and 21(40.4%) paramedical students changed the pads two times a day. Almost 97(66.0%) MBBS and 30(57.7%) paramedical girls bath every-day. Around 74(50.3%) MBBS students wash the genitals during menses after changing the pad with water and soap while 28(53.8%) paramedical girls washing with water only. Every MBBS and paramedical students washed their hands during changing the pad/cloth every-time. 108(73.5%) MBBS girls and 39(75.0%) paramedical girls washed their hands with soap and water. Every student wrapping the pad in paper and discarded in emptied bin except one paramedical student bury the pad i.e. 1(2.6%). Around 59(40.1%) MBBS girls and 27(51.9%) paramedical girls faced problems in attending the class during menstruation and 88(59.9%) MBBS and 34(65.4%) paramedical students were changing the pad during institute hours. (Table 5)

Discussion :

In the present study, 92 (62.5%) MBBS students & 30 (57.6%) paramedical students were in age group of 18-22 years. Similar findings were reported by Neelima Sharma et al[7] study. Study done by Hinaben R. Patel, Ravikant R. Patel[8] where all students were in age range between 16-22 years of age and majority of girls were in 18-20 years of age (86.71%) in medical students.

Majority of girls were Hindu by religion, both parents educated up to graduate & above, 115(78.2%) MBBS students belong to nuclear family whereas 27(51.9%) paramedical students belong to joint family in the present study. The findings of present study are comparable to the study of Aruna Marati Savanthe, Vrushabhendra Halevoor Nanjundappa[9] where study population were Hindus (91.47%) and from nuclear family (66.8%). Most of their mothers were illiterates (35.3%), followed by those who have completed secondary schooling (27.8%), and most of the student's fathers completed secondary schooling (33.5%), followed by 23.5% of them being illiterate.

All participated adolescent girls had attained menarche at the age group of 13 years. Very few subjects 12(8.1%) MBBS girls & 7(13.5%) paramedical girls had the onset of menstruation before ≤ 11 years in the present study. The study findings are similar to the findings of Dasgupta A, Sarkar M [10] where majority of study subjects had menarche in age group of 12-13 years. The findings is also comparable to study by Thakre S.M. et al[11] where majority of the girls 283 (73.1%) attained menarche in the age group of 12-13 years. On the contrary, Patil M.S. et al[12] in their study reported that most of the study subjects (58.1%) had attained menarche at 14-16 years while 41.9% adolescent girls had attained menarche at 11-13 years. The difference observed in the age onset of menstruation could be due to environmental, geographical and nutritional variations of study population.

While obtaining the information regarding knowledge about menstruation, MBBS students have better knowledge as compare to paramedical students in the present study. The higher percentage of knowledge among MBBS students is due to

majority of girls were belong to upper socio-economic class and may be due to increase socialization and increase usage of internet. In study conducted by Patel R, Kubde S [13] in Nagpur and Kalpana Katiyar et al[14] at urban area of Meerut only 55.57% and 38.0% girls had knowledge regarding menstruation. The findings of study is similar to the findings of Kamath K et al[15] where majority of the respondents in both urban (91.9%, n=248) and rural (92.1%, n=258) were aware about the normal duration of menstrual cycle i.e. 3-5 days.

Sociocultural believes towards menses, mostly girls were following some restrictions during menses in both the group (MBBS students & Paramedical students) in the present study. In Neelima Sharma et al[7] study among medical students found that 51(86.4%) of girls had to practice restrictions during menses like cannot go to religious places, 50(84.74%) students were not allowed to attend religious ceremonies, 55(93.22%) cannot enter kitchen and not allowed to make food was restricted. Similar finding were reported in study Thakre SB et al[11] &S B Salve et al.[16] While some are restricted to eat certain food items like tamarind, pickle and even curd which according to some myth is supposed to disturb ovarian functions. Similar type of restrictions was reported by other studies also.[10,11,17,18]

In the present study more than half 120(81.6%) MBBS girls & 38(73.1%) paramedical girls used sanitary pad during menses. 17(62.9%) MBBS students & 8(57.1%) paramedical students were reusing the cloth during menses. Similar findings were reported by Neelima Sharma et al[7] where 86.36% medical students were using sanitary napkins as absorbent material, while 10.79% were practicing cloth during their menstrual cycle which is in accordance with Adhikari P et al[19] and Juyal et al.[20] While 70.2% and 81.73% girls were using sanitary napkin as an absorbent in study conducted by Subhangi Nayak et al[21] and Madhumita B et al[22] respectively.

Every student wrapping the pad in paper & discarded in emptied bin except one paramedical student bury the pad i.e. 1(2.6%) in the present study where-as study done by Hinaben R. Patel, Ravikant R. Patel[8] reported that 71.94 % girls were disposing the used absorbent in Public dustbin followed by dispose with domestic refuse (14.29%). In Subhangi Nayak et al[21] study noted that 71.94 % girls were disposing the used absorbent in Public dustbin followed by dispose with domestic refuse (14.29%). 70.2% of girls wrapped the used absorbent in paper and threw it off.

In the present study almost 97(66.0%) MBBS & 30(57.7%) paramedical girls bath every-day. 74(50.3%) MBBS students wash the genitals during menses after changing the pad with water & soap while 28(53.8%) paramedical girls washing with water only. Study done by Hinaben R. Patel, Ravikant R. Patel[8] reported that majority of girls had habit of cleaning genital in a day either during bathing or every time with toilet (97.5%) & 68.18% of girls were using soap and water and 31.18% only water as a cleaning agent for genital which is in contrast with the study conducted by Neelima Sharma et al[7] among medical students were only 42% doing vaginal wash daily.

In study conducted by Dasgupta et al[10] and Madhumita B et al[22] found that 97.5% and 64.74% of girls cleaned their external genitalia with soap and water regularly during the days of menstruation respectively. Different studies from India and abroad have reported that 34-42.2% adolescent cleaned their external genitalia with soap and water during menstruation.[11,23,24,25] Surprisingly 94% of girls used to wash their genitalia as seen in a study in Uttarakhand.[20]

Conclusion :

Overall, menstrual knowledge (bleeding days, source of blood, material used during periods) & practices (using sanitary pads & its dispose method) are better in the MBBS students as compared to paramedical students. The gap in the knowledge & practices may be due to external environment like exposure to media, family status & atmosphere of schools & institute. But regarding sociocultural believes, both group were believing& following some traditional practices. Still, there is need for sensitizing the adolescent girls and increasing their knowledge towards menstruation. An integrated menstrual education program should emphasize the

physiological basis of menstruation. A scientific understanding of menarche is vital to prepare teenage girls to be physically, emotionally, socially, psychologically and spiritually healthy, leading to a flamboyant, proactive and a well-knit society and nation.

Declaration :

Funding: Nil

Conflict of Interest: Nil

Reference :

1. Tanoja Bachloo , Randhir Kumar, Anmol Goyal , Parmal Singh , Sachin Singh Yadav, Anu Bhardwaj , Anshu Mittal. A study on perception and practice of menstruation among school going adolescent girls in district Ambala Haryana, India. Int J Community Med Public Health. 2016 Apr;3(4):931-937.

2. Dube S, Sharma K. Knowledge, attitude and practice regarding reproductive health among urban and rural girls: A comparative study. Ethno Med 2012;6(2):85-94.

3. Kulkarni AP, Baride JP. Care of Special Groups (Maternal-Child Health and Care of Old Persons). In: Textbook of Community Medicine. Vora Medical Publication, Mumbai. 2nd Ed. 2002;519-22.

4. Sapdoka D, Sharma D, Budhathoki SS, Khanal VK, Pokharel HP. Knowledge and practices regarding menstruation among school going adolescents. J Kath Med Coll 2013 Jul-Sept; 2(5): 122 -28.

5. Malleshappa K, Krishna S, Nandini C. Knowledge and attitude about reproductive health among rural adolescent girls in Kuppammandal: An intervention study. Biomedical Research 2011; 22(3). Available from : http://www.indmedica.com/journals.php?journalid=12&issueid=150.

6. Gujarat Hinaben R. Patel , Ravikant R. Patel. A cross sectional study on menstruation and menstrual hygiene among medical students of Valsad Gujarat. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2016 Dec;5(12):4297-4302.

7. Neelima Sharma, Pooja Sharma, Neha Sharma, R.R. Wavare, Bishal Gautam, Madan Sharma. A cross sectional study of knowledge, attitude and practices of menstrual hygiene among medical students in north India. The Journal of Phytopharmacology2013; 2(5): 28-37.

8. Hinaben R. Patel, Ravikant R. Patel. A cross sectional study on menstruation and menstrual hygiene among medical students of Valsad, Gujarat.International Journal of Reproduction, Contraception, Obstetrics and Gynecology; 2016 Dec;5(12):4297-4302.

9. Aruna Marati Savanthe, Vrushabhendra Halevoor Nanjundappa. Menstruation: a cross-sectional study on knowledge, belief, and practices among adolescent girls of junior colleges, Kuppam, Andhra Pradesh. International Journal of Medical Science and Public Health 2016 ;5(01):22-27.

10. Dasgupta A, Sarkar M.Menstrual Hygiene: How Hygienic is the Adolescent Girl.Indian Journal of Community Medicine;2008;April 33(2).

11. Thakre SB, Thakre SS, Reddy M, Rathi N, Pathak K, Ughade S. Menstrual hygiene: Knowledge and practice among adolescent school girls of Saoner, Nagpur District. Journal of Clinical and Diagnostic Research 2011 Oct;5(5): 1027 – 33.

12. Patil SM, Wasnik V and Wadke R. Health problems amongst adolescent girls in the rural areas of the Ratnagiri District of Maharashtra. Journal of Clinical and Diagnostic Research 2009; 3(8):1784 90.

13. Patel R, Kubde S. Comparative study on menstrual hygiene in rural and urban adolescent, International Journal of Medical Science and public health. 2014;39(2):129-31. 13.

14. Katiyar K, Chopra H, Garg SK. KAP study of menstrual problems in adolescent females in an urban area of Meerut. Indian J Community Health. 2013;25(3):217-20.

15. Kamath K , Ghosh D, Lena A , Chandrasekaran V. A study on knowledge and practices regarding menstrual hygiene among rural and urban adolescent girls in Udupi Taluk, Manipal, India. Global journal of Medicine and Public health 2013; (2)4.

16. S B Salve, R K Dase,S M Mahajan. Assessment of knowledge and practices about menstrual hygiene amongst rural and urban adolescent girls- A comparative study.Internat J recent Trends Science Technology 2012;3(3):65-70.

17. Narayan KA, Shrivastava, DK, Pelto PJ, Veerapmmal S. Puberty rituals, reproductive and health of adolescent school girls of south India. Asia Pacific Population Journal June, 2001; 16:225-38.

18. Mudey AB, Keshwani N, Mudey GA, Goyal RC. A cross-sectional study on the awareness regarding safe and hygienic practices amongst school going adolescent girls in the rural areas of Wardha district. Global Journal of Health Science 2010; 2/2:225-231.

19. Adhikari P, Kadel B, Dhungel SI. Knowledge and practice regarding menstrual hygiene in rural adolescent girls of Nepal. Kathmandu Univ Med J (KUMJ). 2007 Jul-Sep;5(3): 382-6.

20. Juyal R, Kandpal S D, Semwal J, Negi K S. Practices of Menstrual hygiene among adolescent girls in a district of uttarakhand.Ind Jou of Comm Med.2012 April; 24(2).

21. Nayak S, Toppo NA, Tomar SP, Kasar PK, Tiwari R. A study on practices regarding menstrual hygiene among adolescent girls of urban areas of Jabalpur District. Int J of Med Sci and Pub Heal. 2016;5(11):1-3.

22. Bhattacharyya M, Sen P, Hazara S, Sinha R, Sahoo S. A study of Menstrual Hygiene among adolescent school girls in a slum area of Kolkata, National Journal of Community Medicine. 2016;6(2):345-8.

23. Ziade FM, Neheme M. Assessment of beliefs and practices relating to menstrual hygiene of adolescent girls in Labanon. IJHSR. 2013;3(12):75-88.

24. Arumugam B, Nagalingam S, Varman PM. Men-strual hygiene practices: is it practically impractical. Int J Med Public Health. 2014;4(4):472-6.

25. Kavitha V.R.S. Reproductive health and hygiene among adolescents. http:/www language in India. 2012;12(2):293-300. Accessed on 8th June 2018.

A Cross Sectional Study of Immunization Coverage among the Children of Labourers at Civil Hospital, Ahmedabad

Hetal Y. Patel[1], Archi Dave[1], Hely B. Patel[1], Rajshree Bhatt[2]

[1] Second year Resident, [2] Assistant Professor, Community Medicine Department, B. J. Medical College, Ahmedabad, Gujarat, India.

Correspondence : Dr. Archi Dave, Email: archidave01@gmail.com

Abstract:

   Introduction : The Government of India launched Universal Immunization Program (UIP) on 10th November 1985 with the main objective of covering at least 85% of all infants against the six preventable disease that is crucial in reducing infant and child mortality, which is considered to be a good indicator of the health coverage of the population. In the past few decades immunization coverage rates have improved sufficiently in developed countries whereas most of the developing countries are still struggling with faltering rates. Construction workers are more vulnerable to health and social issues so are their children. **Objectives :** 1) To know immunization coverage of under five children in construction labour population at civil hospital campus, Ahmedabad. 2) To study various factors associated with the immunization coverage of those children. **Methods :** A cross sectional study was conducted at construction site of civil hospital campus during July-Sept 2018. Information of 76 children was collected by personal interviews of mother with help of a pre-designed and pre-tested structured Questionnaire. **Results :** Overall 43.42% children were completely immunized, 53.94% were artially vaccinated, 2.63% were unvaccinated. Factors associated with poor immunization were home delivery, illiteracy of mother& higher birth order but statistically found not significant. **Conclusion:** Unfortunately the immunization coverage was found to be very low. There is an urgent need for regular health education sessions and should be the target of RCH programme with special focus on immunization related activities.

Key Words : Immunization, Labour population, Under five children.

Introduction:

   WHO declared universal health coverage for everyone and everywhere. Immunization is one of the most important and cost-effective public health intervention. We still have 25% mortality of under-5 due to same . We anticipate and argue that within the urban areas disparities and inequities persist in immunization coverage and that the socioeconomically disadvantaged, particularly those who reside in construction areas are more vulnerable and may contribute to the lower uptake of immunization. In Sept 2015 we adopted Sustainable Development Goals (SDG) for healthy, wealthy and strong nation and immunization has a crucial role in achieving 14 out of 17 SDGs. We can achieve it better way if we consider all children especially in high risk pockets like construction site and labor residentially

Method :

   A Community based cross sectional study was conducted during July to September 2018 at Four Construction sites of Civil Hospital campus, Ahmedabad. All Under-5 children of construction site colonies were included. Total 76 Under-5 children of laborers were included in study. The Data Collection was carried out by interview of mothers with the help of self designed and pre-tested Structured questionnaire. The questionnaire included socio-demographic variables, immunization status of the children, reasons for incomplete immunization. As no mother had Mamta Card, information regarding vaccine was collected by "Recall Method". Verbal consent was taken from mothers and who non-willing to participate were excluded. Statistical analysis was done by using chi square test. P Value < 0.05 is considered as level of significance.

Result:

Table 1: Socio-Demographic characteristics of children

Variables	Category	Frequency
Gender	Male	36 (47.40%)
	Female	40 (52.60%)
Age(in Months)	<18 months	26(34.21%)
	⩾18 months	50(65.79%)
Native state	Chhattisgarh	35(46.05%)
	Madhyapradesh	25 (32.90%)
	Bihar	10 (13.16%)
	Uttarpradesh	6 (7.89%)
Education of mother	Illiterate	46(60.53%)
	Literate	30(39.47%)
Education of Father	Illiterate	38(50%)
	Literate	38(50%)
place of delivery	Home	21 (27.60%)
	Institutional	55 (72.40%)
birth order	1st	28(36.84%)
	⩾2nd	48(63.16%)

Out of total 76 study population, 36 children were male and 40 were   female. 26 participants were <18months of age. None of them were from Gujarat, mostly they were from Chhattisgarh 35(46.05%). [Table 1]

Table 2 shows children who had literate parents and 1st birth order were more immunized compare to other. Children whose mother delivered their child before the legal age of marriage were less immunized.

As per Table 3, only 2 children missed their Birth dose. From the eligible children for Measles 33(50%)

missed it. none of eligible child were vaccinated with MR vaccine during MR campaign.

Table 4 shows, from total 76 children, 33 were immunized age appropriately. Among Children having age 12 month -23 month, out of 15 only 6 were fully immunized and 2 children were completely unvaccinated.

Majority of parents were not aware of site (90.7%) and schedule (95.3%) of vaccination. Only 4 of the mother did not get their kids to get vaccinated due to fear of side effects. [Table 5]

Table 2: Various Socio-Demographic Factors Affecting Vaccine coverage

Variable	Category	Completely Vaccinated	Un/Partially Vaccinated	TOTAL	Statistical Analysis
Gender of Child	Male	13 (36.10%)	23(63.90%)	36(47.40%)	χ^2=1.48
	Female	20(50%)	20(50%)	40(52.60%)	p=0.22
Education of Mother	Illiterate	17(37%)	29(63%)	46(60.50%)	χ^2=1.98
	Literate	16(53%)	14(47%)	30(39.50%)	p=0.15
Education of Father	Illiterate	14(36.80%)	24(63.20%)	38(50%)	χ =1.33
	Literate	19(50%)	19(50%)	38(50%)	p=0.24
Age of 1st Pregnancy	<18Year	1(16.70%)	5(83.30%)	6(7.90%)	χ^2=1.90
	⩾18Year	32(45.70%)	38(54.30%)	70(92.10%)	p=0.17
Place of Delivery	Home	12(57.10%)	9(42.90%)	21(27.60%)	χ^2=2.22
	Institutional	21(38.20%)	34(61.80%)	55(72.40%)	p=0.13
Birth Order	1st	15(53.60%)	13(46.40%)	28(36.80%)	χ^2=1.85
	⩾2nd	18(37.50%)	30(62.50%)	48(63.20%)	p=0.17

Table 3: Vaccination status as per Age

Age at Vaccine missed	Eligible	Missed vaccine	Missed vaccine %
At birth	76	2	2.63
1.5 Months	76	23	30.26
2.5 Months	76	26	34.21
3.5 Months	73	26	35.61
9 Months	66	33	50.00
24 Months	54	26	48.14
MR campaign	67	67	100.00

Table 4: Vaccination Status

Immunization status	Frequency	%
Completely immunized	33 out of 76	43.42
Fully immunized	6 out of 15	40.00
Partially immunized	41 out of 76	53.94
Unimmunized	2 out of 76	2.63

* Completely immunized: Child who has taken upto age vaccine dose
* Fully immunized: Children age 12-23 months (BCG, measles, 3 doses each of polio and DPT)

Table 5: Reasons for missed vaccine

Don't know where to go for vaccination	39 (90.70%)
Not aware about the Schedule	41 (95.30%)
Do not want to get Vaccinated	4 (9.30%)

Discussion:

Vaccination in construction site is an obligatory problem. Despite all effort taken by Government, still there remain some elements of incomplete immunization of the children.

Present study shows that vaccination coverage was higher in children having literate mother which is supported a study of Kapoor et al[3] and a cross-sectional study conducted by Siddiqui et al in urban Karachi[4] . Study conducted in Sydney during 1999 reported that, parents not only valued the benefits of protecting their own individual child but mothers from a range of socioeconomic and educational backgrounds also understood and appreciated the social nature of the vaccination decision.[5]

Authors did not find any gender difference in immunization coverage. This finding was consistent with the results of other studies on migrants (Barretto et al). Similarly our observations agree with Waldhoer et al & Antai for increasing mother's age increase the likelihood of a child being fully immunized.[6] We believe that older mother's age is probably associated with greater maturity, awareness and social networking with older mothers, which results in better odds of a child being fully immunized.

Ahmedabad had 36% MR campaign coverage against the state average of 63%. Civil campus comes under Girdhar Nagar ward that had 22% coverage but in This study population none of the eligible children were vaccinated with MR Vaccine .[7]

As far as overall immunization status is concerned, we found in this study that 40% were fully immunized and 53.94% children were partially immunized. The findings indicate that still there were some children lost to follow up and missed some vaccines.

Study done in Jharkhand found that 78.5% children were fully immunized and 21.5% children were partially immunized. This is similar to the study done by Govani K J where 74% children were fully immunized and 26% children were partially immunized. In both the study, not even a single unimmunized child was found.[8] Similar study by Mahyavanshi DK showed that nearly 70% of the subjects were fully immunized and the remaining 25% partially immunized. About 4% of the subjects were completely unimmunized[9] while in present study they were 2.63%.The percentage of complete immunization in our study was lower than the coverage rate reported in several studies in India,[10] Karachi[11] and Nigeria[12, 13] (50%, 70%, 62%, 55%)

respectively. Immunization coverage in our study was found to be lower than NFHS-IV. Nearly 50.4% of the children were fully immunized in Gujarat,[14] 62.00% in India.[15] The lower than expected coverage observed in the current study reinforces the need for continuous motivation, regular supervision, monitoring and evaluation to detect any declines in vaccination.

In present study population 9.3% mother did not want their child to get vaccinated due to fear of getting side effects, similar reason was given by Rajaat vohra et al Lucknow with 21% of parents of not having faith in immunization.[15]

Conclusion:

No Mamta card was found in study family. Immunization coverage was poor for children more than 1 year of age especially for MR Vaccine (coverage was 0%). Various factors like higher birth order, low age of 1st pregnancy, education of parents and place of delivery were affecting immunization. This highlights the need to develop outreach site specific healthcare services.

Recommendations:

Health workers should emphasis more on vaccination of high risk areas like construction site. Such sites should be the target of RMNCH+ A programme with special focus on immunization related activities. Awareness regarding vaccination and Monitoring of immunization programme by health authority should be done frequently at such sites. Vaccination sessions need to be frequently conducted as mobile camps according to the convenient time for laborers. Mobile health care clinics should be introduced at construction sites.

Declaration :

Funding: Nil

Conflict of interest: Nil

References:

1. Kalaivani K, Mathiyazhagan T, Patro BC. Editorial. News Lett Nat Inst Health Family Welfare 2006;8:1-2. Accessed 10 July 2016.

2. Sustainable Development Goals.https:// www.gavi.org/about/ghd/sdg/ Last accessed 23rd October 2019

3. S. KR and V. Kapoor R and Vyas S. Awareness and Knowledge of mothers of under five children regardingimmunization in Ahmedabad. Healthline 2010;1(1):12-15.

4. Siddiqui N, Siddiqi AE, Nisar N and Khan A. Mothers knowledge about EPI and its relation with age –appropriate vaccination of infants in peri-urban Karachi. J Pak Med Assoc 2010; 60(11):940-944. J PAK MED Assoc 60(11):940–4.

5. Leask J, Chapman S, Hawe P, Burgess M. What maintains parental support for vaccination when challenged by anti-vaccination messages? A qualitative study. Vaccine. 2006 Nov 30;24(49-50):7238-45. Epub 2006 May 23. [PubMed]. 2006;Available from: https://www.ncbi. nlm.nih.gov/pubmed/17052810

6. Yadlapalli S. Kusuma, Rita Kumari, Chandrakant S. Pandav and Sanjeev K. Gupta. Migration and immunization: determinants of childhood immunization uptake among socioeconomically disadvantaged migrants in Delhi, India. Tropical Medicine and International Health volume 15 no 11 pp 1326–1332 November 2010.

7. https://www.dnaindia.com/ahmedabad/report-measles-rubella-vaccination-in-ahmedabad-36-gujarat-63-2650876.

8. Govani KJ , Sheth JK , Bala DV. Immunization Status of 12-23 months Children in Rural Ahmedabad;healthline 2013: Volume 4 Issue 1 : p 38-42. Healthline 2013;4(1):38–42.

9. Mahyavanshi DK, Nagar SS, Patel MG, Nagar SS, Purani SK, Kartha GP. Evaluation of immunization coverage among children aged 12-23 months in Surendranagar city. Int J Basic Clin Pharmacol 2013;2:286-9. 2013;2.

10. BITS. Management Group, Medical Center, Birla Institute of Technology and Science (BITS), Pilani. Maternal knowledge and perceptions about the routine immunization programme-a study in a semiurban area in Rajasthan. 2003; 57(4): 158-63. 2003;57(4):158–63.

11. Nisar N, Mirza M, Qadri MH. Knowledge, attitude and practices of mothers regarding immunization of one year old child at Mawatch Goth, Kemari town, Karachi, Pakistan. Pak J Med Sci 2010; 26(1): 183-90. 2010;26(1):183–90.

12. Odusanya OO, Alufohai EF, Meurice FP, Ahonkhai VI. Determinants of vaccination coverage in rural Nigeria. BMC Public Health 2008; 381 (8): 1471-2458. 2008;381(8): 1471–2458.

13. Odusanya OO, Alufohai JE, Meurice FP, Clemens R, Ahonkhai VI.Short term evaluation of a rural immunization program in Nigeria. J Natl Med Assoc 2003; 95:175-9. 2003;95:175–9.

14. National Family Health Survey, Indiahttp://rchiips.org/ nfhs/factsheet_nfhs-4.shtml Last accessed 23rd October 2019

15. Vohra R, Vohra A, Bhardwaj P, Srivastava JP, Gupta P. Reasons for failure of immunization: A cross-sectional study among 12-23-month-old children of Lucknow, India. Adv Biomed Res. 2013;2:71. Published 2013 Jul 30. doi:10.4103/2277-9175.115809

Ante Natal, Intra-Natal and Post Natal Determinants of Sick Neonates Admitted To Neonatal Intensive Care Unit (NICU) in Tertiary Care Government Hospital of Agra District

Rudresh Negi[1], Renu Agrawal[2], Sunil K. Kaushal[2], Sunil K. Misra[3]

[1] Resident, [2]Associate Professor,[3] Professor and Head, Department of Community Medicine, S.N. Medical College, Agra, India
Correspondence : Dr. Renu Agrawal, E mail: renua13@gmail.com

Abstract :

Introduction: Neonatal period is a decisive stage where foundations of a healthy life are laid. Morbidity, mortality and hospital admissions during neonatal period may have an antecedent cause in pregnancy, delivery or post natal care. Precautions in each phase enables reduction in unnecessary, repeated hospitalizations. Under this background the research dwells into the ante natal, intra natal and post natal factors in the sick neonates admitted to Neonatal Intensive Care Unit (NICU) of tertiary care government hospital. **Method:** The cross sectional study was conducted among 450 sick admitted neonates. A pilot tested, face validated questionnaire was used to collect data regarding ante natal, intra natal and postnatal characteristics. Data analysis was done in Microsoft Excel 2016. **Results:** During Ante Natal Care (ANC) there was high coverage for pregnancy registration (97.3%) with 22.4% of mothers undergoing <4 ANC visits. Protection against tetanus was in 91.3% pregnancies. There were 8.2% home deliveries and 26% caesarean section. The mean age of gestation was 33.8 ±3.8 weeks and the mean birth weight was 2.08 ±0.7 kg. Immediate cry post birth was in 66.8% neonates. **Conclusion:** To sum up, in spite of good ante natal care there are more mothers with higher risk admitting their new-borns in NICU who at times are pre term or of low weight.

Key Words : Admission Neonatal Intensive Care Unit (NICU), Ante Natal Care (ANC), Determinants, Neonate, Post natal care

Introduction :

Globally in 2017 an estimated 6.3 million children and young adolescents died, of which 2.5 million were newborns approximately 7,000 deaths every day – most of whom died in the first week after birth. About 36 per cent died the same day they were born, and close to three-quarters of all newborn deaths in 2017 occurred in the first week of life. The first month is the most crucial period for child survival. The global neonatal mortality rate fell from 37 deaths per 1,000 live births in 1990 to 18 in 2017.[1] It is thus crucial that appropriate feeding and care are provided during this period, both to improve the child's, chances of survival and to lay the foundations of a healthy life.[2] Healthy and sturdy babies are likely to evolve as physically and mentally strong. Neonatal care is highly cost effective because saving the life of a newborn baby is associated with survival and productivity for over 5 decades. [3]

A healthy mother has a greater potential to deliver a healthy neonate, thus reducing admissions to neonatal centres, and so an efficient, alert and responsive ante natal care system provides a crucial window of opportunity to better the health of the mother and prepare her for delivery, complications and post natal care. Intra natal factors like place of delivery, type of delivery, skill level of birthing attendant and observations of aseptic precautions have a bearing on the well-being of the newborn as well. Sufficient post natal care also remains a vital domain in decreasing ailments in the neonate thereby shrinking their admission rates.

Thus, admission of a sick neonate to NICU is dependent directly and indirectly on a multitude of factors and this research enunciates some of the ante natal, intranatal and post natal characteristics.

Method:

This research was conducted as a cross-sectional study in the NICU of a government medical college in Agra district. Data was obtained from previous years to estimate the one year case load of neonatal

admissions which stood at approximately 1200. All neonates admitted to the NICU in a one year period were eligible for the study. Data was collected twice in a week from the NICU and due to paucity of resources and unavailability of primary care provider in many instances a total of 450 study subjects were included whose parents / guardians gave written informed consent for participation. A semi-structured questionnaire was used and details were collected by means of one to one personnel interviews. Institutional Ethical clearance (Letter no IEC/2017/35) and permission from NICU in charge was obtained for the study.

Data thus collected was entered in Microsoft Excel 2016 and analysed using the same. Mean, standard deviations, proportions and percentages were calculated wherever appropriate.

Operational Definitions :

Neonate /Newborn Period - It refers to the period of less than 28 days after birth.[4]

Low Birth Weight (LBW)- Birth weight of less than 2500 gm irrespective of gestational age.[4]

Extremely Low Birth Weight (ELBW)- Birth weight of less than 1000 gm irrespective of gestational age.[4]

Pre term - Gestational age of less than 37 completed weeks (i.e. less than 259 days) [5]

Term - Gestational age of 37 to less than 42 completed weeks (i.e. 259 to 293 days) [5]

Full Ante Natal Care- Full antenatal care is at least four antenatal visits, at least one tetanus toxoid (TT) injection and iron folic acid tablets or syrup taken for 100 or more days. [6]

Pre lacteal feeds- Foods and drinks given to a newborn baby before breastfeeding has started are called prelacteal feeds. [7]

Early initiation of breastfeeding- Provision of mother's breast milk to infants within one hour of birth.[8]

Results:

Maximum mothers of sick neonates belonged to the age group 25-30 years with the mean age being 24.97±4.1 years. Teenage pregnancies were at 4.6%. It was observed that 16.3% of mothers were married before the legal age of 18 years, and nearly half (48.1%) first conceived at an age <21 years. Maximum number of females were married in the age group of 18-20 years (47.8%) followed by 21-24 years (30.2%).Numbers of mothers for first conception rise sharply from less than 18 years to 18-20 years (39.8%), with peak at 21-24 years (40%) and trailed by a steady decrease.The mean age for marriage was 19.9 ±2.9 years and that for first conception as 21.0 ±3.0 years.   Among mothers less than half (40.7%) were illiterate. With increasing maternal education the number of mothers showed a declining trend. [Table 1] Almost all the mothers were home makers (97.6%). Birth spacing of less than three years was in 63.3% of multigravida.

There was a high coverage for pregnancy registration (97.3%) of which nearly three fourths (74.9%) are registered at a government setup. About one fifth (22.4%) of the females underwent inadequate ANC visits(<4 visits). Although IFA intake is high (74.5%), but only 36.9% of the total women took adequate iron folic acid (IFA) tablets. Complete TT immunization coverage was nearly full (91.3%). Almost every third mother has received full ante natal care.(31.8%). Nearly half (45.8%) of the mothers had anaemia, followed by hypertension (9.3%). One case of HIV and 2 cases of tuberculosis were also revealed during ANC care.[Table 2]

A substantial proportion of the deliveries were institutional (91.8%) while the rest (8.2%) were conducted at home. Among the 413 institutional deliveries nearly half (46%) were conducted in private hospitals and nursing homes, followed by community health centre (CHC) (20.8%). Most common method of delivery was normal vaginal delivery (71.7%), while 26% underwent caesarean section. Of the total admitted neonates most were outborn (85.8%) and more than two thirds of the neonates were delivered by doctors (68.7%). Of the 413 institutional deliveries 35.1% stayed for less than the recommended 48 hrs at the health facility. [Table 3]

Half (239) of the admitted neonates were pre term and 211 were term. The mean age of gestation was

Table 1: Biosocial Profile of Mother of Sick Admitted Neonates

Sr. No.	Parent Variable	Mother N=450	
		n	(%)
1.	Current Age		
	<18 years	2	(0.4)
	18-20 years	61	(13.6)
	21-24 years	151	(33.6)
	25-30 years	200	(44.4)
	31-35 years	28	(6.2)
	35 years	8	(1.8)
2.	Age at Marriage		
	<18 years	73	(16.3)
	18-20 years	215	(47.8)
	21-24 years	136	(30.2)
	25-30 years	24	(5.3)
	31-35 years	2	(0.4)
3.	Age at First Conception		
	<18 years	37	(8.3)
	18-20 years	179	(39.8)
	21-24 years	180	(40)
	25-30 years	51	(11.3)
	31-35 years	2	(0.4)
	>35 years	1	(0.2)
4.	Education Status		
	Illiterate	183	(40.7)
	Primary	116	(25.8)
	High School	64	(14.2)
	Secondary	39	(8.7)
	Undergraduate	40	(8.9)
	Post Graduate	8	(1.8)

33.8 ±3.8 weeks and the mean birth weight was computed as 2.08 ±0.7 kg. Birth weight was in normal range (>=2500 g) in 37.3% neonates, while the rest (62.7%) were LBW. LBW neonates show a decreasing trend in numbers with successive lower weight category. About two thirds (66.8%) of neonates cried immediately after birth. Merely 11.8% neonates took early bath. Talcum powder, oil was applied in almost one fifth (17.3%) of neonates. 17.6% of neonates were given pre lacteal feeds which mainly included honey, jiggery, tea and powdered milk. Early initiation of breastfeeding within 1 hr was present in merely 5.3 % neonates.Only 17.5% of neonates were completely immunized and the common reason for incomplete or no immunization was that the neonate was very sick (72.5) or lack of awareness (15.1%) among care providers. [Table 4]

Table 2: Ante Natal Care Determinants Associated with Admitted Sick Neonates

Sr. No.	Variables	Mothers of Neonates	
		n	(%)
1.	**Registration of Pregnancy(N=450)**		
	Yes	439	(97.3)
	No	11	(2.5)
2.	**Place of Registration (N=439)**		
	Sub centre	94	(21.4)
	PHC	74	(16.9)
	CHC	71	(16.2)
	District Hospitals (DH)	70	(15.8)
	Medical College	20	(4.6)
	Private clinics/hospitals	110	(25.1)
3.	**ANC Visits (N=450)**		
	<4	101	(22.4)
	4-7	247	(54.9)
	8-11	74	(16.4)
	>11	28	(6.2)
4.	**IFA Intake Adequacy (N=450)**		
	Adequate (>= 3 months)	166	(36.9)
	Inadequate (< 3 months)	169	(37.6)
	No Intake	115	(25.6)
5.	**Mothers Protected Against Neonatal Tetanus (N=450)**		
	Yes	411	(91.3)
	No	39	(8.7)
6.	**Full Ante Natal Care**		
	Yes	143	(31.8)
	No	307	(68.2)
7.	***Chronic Illness in Mothers**		
	Diabetes	8	(1.7)
	Hypertension	42	(9.3)
	Hepatitis B	6	(1.3)
	Anaemia	206	(45.8)
	Others(asthma, hypothyroidism, HIV TB etc)	19	(4.1)

* Multiple Response Question (Each Percentage taken out of 450)

Table 3: Intra Natal Determinants of Sick Neonates Admitted to NICU

Sr. No.	Variables	Number of Newborns	
		n	**(%)**
1.	**Place of Delivery (N=450)**		
	1. Home	37	(8.2)
	2. Institutional	413	(91.8)
2.	**Institutional Place of Delivery (N=413)**		
	PHC	18	(4.4)
	CHC	86	(20.8)
	DH/Govt Hospitals/Trust	55	(13.3)
	Medical College	64	(15.5)
	Private Hospital	190	(46.0)
3.	**Type of Delivery (N=450)**		
	Normal Vaginal Delivery	323	(71.7)
	Assisted Vaginal Delivery	10	(2.3)
	Caesarean Section	117	(26)
4.	**Delivery (N=450)**		
	Inborn	64	(14.2)
	Outborn	386	(85.8)
5.	**Delivery Conducted by (N=450)**		
	Doctor	309	(68.7)
	ANM	12	(2.7)
	Nurse	101	(22.4)
	Dai	28	(6.2)
6.	**Duration of Stay of Mother at Health Facility post Delivery (N=413)**		
	<2days	145	(35.1)
	2-6 days	245	(59.3)
	>6 days	23	(5.6)

Discussion:

In our study the mean age of mothers was 24.97 years which was similar to that found in the research by Srivastava NM et al (2009) (24.8 years), and Shah S et al (2012)(26.7 years).[9,10] Maximum mothers in our study (44.4%) belonged to the age group of 25-30 years in contrast to the study by Kawale S et al (2016) where 40.85% were from a younger age group of 15-19 years.[11] Study by Salih FA et al (2017) had 50% belonging to age group 21-35 years.[12] These demographic variations may be on account of inherent differences in the populations of these regions.

The current study identified 59.3% of mothers of admitted neonates were literate. NFHS 4 data for Agra identifies 63% of women and 86.3% men being literate in the general population, indicating more neonates of those parents who were illiterate were admitted.[37] Compared to our study Kawale S et al (2016) had less mothers (46.39%) as literates while

Table 4: Post Neonatal Factors Associated with Sick Neonatal Admissions to NICU

Sr. No.	Variables	Number of Neonates N=450	
		n	(%)
1.	**Gestational Age**		
	Preterm (<37wk)	239	(53.2)
	Term (37-<42 wk)	211	(46.8)
2.	**Birth Weight**		
	>=2500	168	(37.3)
	2499-1500	182	(40.4)
	1000-1499	74	(16.4)
	<1000	26	(5.8)
3.	**Immediate Cry at Birth**		
	Yes	301	(66.8)
	No	133	(29.6)
	Don't Know	16	(3.6)
4.	**Early Bathing of neonate**		
	Yes	53	(11.8)
	No	397	(88.2)
5.	**Application on Stump**		
	Yes	78	(17.3)
	No	372	(82.7)
6.	**Pre lacteal feeds at birth**		
	1.Yes	79	(17.6)
	2. No	371	(82.4)
7.	**Early initiation of breastfeeding**		
	1. Present	24	(5.3)
	2. Absent	426	(94.7)
8	**Immunization status**		
	Complete	79	(17.5)
	Incomplete	22	(4.9)
	None	349	(77.6)

Salih FA et al (2017) had 38.9% mothers as illiterate.[11,12]

In our study nearly all mothers were homemakers (97.6%) in contrast to study by Kawale S et al (2016) where 58.85% mothers were unemployed(students or housewives).In present study though 33.6% of mothers were educated at high school and above yet

nearly all were housewives; suggesting their only role in house despite potential employability.[11]

In this study 16.3% of mother were married before the legal age of 18 years and 8.3% first conceived at an early age of less than 18 years with 4.6% being teenagers during the current childbirth. Inability to abolish marriage before legal age may be

due to laxity in law enforcement as well as the cultural milieu encouraging early marriage. Early marriages leading to teenage pregnancies represent a risk factor for the mother and newborn which is completely avoidable. Still this rate of teenage pregnancy is lower than that observed by Kawale S et al (2016) at 40.85%. Our study found an inadequate birth spacing of less than three years in 63.3% cases.[11] Kawale S et al (2016) in their study reported 83.72% having a gap of 1-2 years.[11] Inadequate spacing of birth prevents the mother from full recovery and repeated pregnancies at short intervals may precipitate anaemia. Also spacing would enable better care of the children.

In this study 97.3% of the pregnancies were registered which was similar to that in the study by Gupta A et al (2018) with 93.2% registrations.[13] Though our study found 74.9% of registered pregnancies in public sector yet it contributed to only 54% of the institutional deliveries with the rest transferring to private sector. This may be due to several reasons like lack of availability, confidence, and accessibility in government set up.

In the current study 77.5% had four or more ante natal visits which were almost twice of that observed in NFHS 4 for Agra at 37.2%.[37] This is perhaps due to more complications in the mothers of admitted neonates warranting increased contact with health personnel during ante natal period. Study by Mishra AK et al (2017) indicated 60% with adequate ante natal visits and Buch PM et al(2012)observed 75.5% with upto 3 visits.[14,15] Differences in visits may be due to variations in health seeking behaviour among the population. Also the study by Buch PM et al(2012) used an older criteria of 3 ANC visits.[15]

In this study IFA tablets were consumed for 100 days in 36.9% mothers which is almost three times of that observed in NFHS 4 at 13.5%.[16] Full ANC was received by 31.8% mothers in the present study as compared to the district average of 9.5% found in NFHS 4. [37] In line with other ante natal care observations this increase in comparison to the district average may be attributed to high risk pregnancies and active care seeking behaviour in mothers of admitted neonates. Research by Salih FA et al (2017)reveal 52.8% while Saini AG et al (2011)

have 92% receiving some ante natal care.[12,17] Our study had 91.3% mothers protected against neonatal tetanus which is in congruence with that reported by NFHS 4 at 89.3% for Agra district.[37]

In the current study most common chronic illness was anaemia in 45.85% followed by hypertension in (9.3%) cases. However NFHS 4 data revealed anaemia to be present in 39.6% of pregnant women in Agra.[16] Research by Salih FA et al (2017) implicated 23.6% of mothers with illness.[12]

In the current study there were 91.8% institutional and 8.2% home deliveries. Similarly Kotwal YS et al (2018) had 10% and Rao SK et al (2015) had 8.5% home deliveries in their research.[18,19] District level data from NFHS 4 puts the institutional births at 78.7% which is lower than that found in our study and this may be due to better health seeking behaviour and increased ante natal contact with health facility on account of the fact that many pregnancies in our study were at higher risk.[37]

In the present study of the total neonates admitted 8.2% were home delivered, 49.3% at government and 42.2% at private institutions. Study by Samathkumar P et al (2018) had 3% home, 69% PHC, 19% government hospital and 9% private deliveries; while research by Jeganathan S et al (2017)observed deliveries at government hospitals at 80%, primary health centre (PHC) 12%, district hospital (DH) 2.6% and private 1.8%.[20,21] These differences in preferences of deliveries reflect an amalgamation of the practices, convenience, reliance and level of institutional care demanded by the population of these regions.

In the current study 71.7% were normal vaginal deliveries (NVD)and 26% as caesarean section (LSCS). This is in congruence with the study by Verma J et al (2018)with 69 % NVD and 30.4% LSCS, Rathod D et al (2015)with 78.2% NVD and Shah S et al (2012) with 72% NVD.[22,23,10]

In the current study there was a higher percentage of outborn (85.8%) admissions which may be due to extensive catchment area of the institution .Studies by Dwivedi K et al (2017) 57.63%, Mishra AK et al (2017) 56%, Prasad V et al (2011) 58.27%, and Rakholia R et al (2014) 53.54% also reported high percentage of

outborn neonates.[24,14,25,26] In our study 68% of the deliveries were conducted under the doctor's as compared to a study by Buch PM et al (2012)where 81.2% deliveries were by doctors.[15] Study by Srivastava NM et al (2009) indicated 60% skilled deliveries and in the study by Waiswa P et al (2010)58% deliveries were by skilled health professionals.[9,27] Differences in the time period and site of the study might be responsible for these variations.

A sub optimal duration (<48hrs) of postpartum stay at health facility was found among 35% mothers in our study. In contrast the study by Gupta A et al (2018)observed less than 2 days stay in 2.6%.[13] This is contrary to the recommendation of 48 hour post-partum stay in health facility, where we lose an opportunity to provide with post natal care and counseling for the mother and neonate.

The mean gestational age of the sick neonates in the current study is 33.8±3.8 weeks. In the studies conducted by Kotwal YS et al (2018), Jajoo M et al (2017), and Shah S et al (2012)the average gestational age was higher at 36.15 week, 34.28 week and 35.9 weeks respectively.[18,28,10] In the current study there is a slightly higher percentage of preterm neonates (53.2%), similarly study by Dalal E et al (2013)also had 53% preterm admissions.[29]

The current study noted a mean birth weight of 2.08±0.7 kg . Similarly low mean birth weight was observed in the studies by Jajoo M et al (2017)and Shalini B et al (2017)at 2.2 kg.[28,30] Extreme LBW was observed in 5.8% of neonates in our study. Also studies by Parekh ZR eta l(2018), Shah HD et al (2018), Narayan R et al (2017), Kawale S et al (2016), Raikwar P et al (2018) and Modi R et al(2015) observed a similar percentage of neonates with ELBW at 5.4%, 5%, 5.14%, 3.9%, 4.8% and 3.27% respectively.[31,32,33,11,34,35]

Immediate cry was present in 66.8% neonates in our research as compared to 72.2% in the study by Salih FA et al (2017).[12] In the current study incorrect post natal practices like early bathing of neonates (11.8%) and application on cord stump(17.3%) was present in relatively small proportion and implies an increased awareness regarding them. In study by Gandhi SJ et al (2014) and

Nigam S et al (2016) early bathing was in 37.8% and 13.9% of neonates.[36,37] Research by Nigam S et al (2016) observed application on stump in 35% newborns.[37] Differences may be due to variations in the cultural milieu of the study setting.

In our study 17.6% neonates were given pre lacteal feeds. This was lower than observed by Gandhi SJ et al (2014), Nigam S et al (2016) and Reshma et al (2014) at 32.1%, 63%,31% respectively.[36,37,38] These variations may be due to regional traditions and customs. Early initiation of breastfeeding was in 5.3% neonates in our study as compared to the district data at 18.6% according to NFHS 4;this lesser proportion of early breast feeding in our study may be because most of the neonates were sick at birth.[16]

Conclusion:

The study brings to light that the sick neonates admitted to NICU of a tertiary care government hospital had mothers in mainly younger age groups, illiterate, registered for pregnancy, with adequate number of ANC visits, anaemic, largely protected against maternal and neonatal tetanus, delivering in private setup and by doctors. More neonates were preterm and of low birth weight, with few instances of early bathing and pre-lacteal feeding.

Declaration:

Funding: Nil

Conflict of Interest: Nil

References:

1. India Newborn Action Plan. (2018). Available at: https://www.newbornwhocc.org/INAP_Final.pdf [Accessed 13 Aug. 2018].

2. WHO | Infant, Newborn [Internet]. WHO.World Health Organization; 2018. Available from: http://www.who.int/infant-newborn/en/[Accessed 13 Aug. 2018].

3. Bagilkar VV AS.Descriptive Study on Newborn Care. Asian J NursEduc Res. 2015;4(4):383–7.

4. Paul V K, Bagga A, editor. Ghai Essential Pediatrics. 8th ed. New Delhi: CBS Publishers and Distributers Pvt Ltd; 2013. 124-125 p.

5. South East Asia Regional NEONATAL-PERINATAL DATABASE World Health Organization (South-East Asia Region) [Internet]. Available from: https://www.newbornwhocc.org/pdf/database.pdf [Accessed 1 Oct. 2018].

6. India Fact Sheet [Internet]. Available from: http://www.rchiips.org/nfhshttp://www.iipsindia.org [Accessed 1 Sept. 2018].

7. Infant and young child feeding : model chapter for textbooks for medical students and allied health professionals . WHO

publications; 2009 . p. 33. Available from: http://www.wpro.who.int/nutrition_wpr/publications/inf antchildfeeding.pdf [Accessed 14 Sept. 2018].

8. WHO | Early initiation of breastfeeding to promote exclusive breastfeeding [Internet]. WHO. World Health Organization; 2019 [cited 2019 Apr 23]. Available from: https://www.who.int/elena/titles/early_breastfeeding/en/

9. Srivastava NM, Awasthi S, Agarwal GG. Care-seeking behavior and out-of-pocket expenditure for sick newborns among urban poor in Lucknow, northern India: A prospective follow-up study. BMC Health Serv Res. 2009;9:1–10.

10. Shah S, Zemichael O, Meng HD. Factors associated with mortality and length of stay in hospitalised neonates in Eritrea, Africa: A cross-sectional study. BMJ Open. 2012;2(5):1–9.

11. Kawale, SuchitaKotnis SD. Study of Epidemiological Factors Affecting Neonatal Morbidity and Mortality in the Neonates Admitted to Nicu of Tertiary Care Center * Dr SuchitaKawale. Indian J Appl Res. 2016;6(2):198–201

12. Salih FA, Elameen EE. Neonatal mortality contributors using the three delays audit: a study from Albuluk paediatrics teaching hospital in Sudan. Int J Res Med Sci 2017;5:5139-44.

13. Gupta A, Khanna A, Sachan R, Singh VK, Singh OP. Antenatal, intranatal and postnatal care: a tertiary centre study of North India. Int J Community Med Public Health 2018;5:2500-

14. Mishra AK, Panda SC. Status of neonatal death in sick newborn care unit of a tertiary care hospital. Int J ContempPediatr 2017;4:1638-43.

15. Buch PM, MakwanaAM, Chudasama RK, Doshi SK. Status of Newborn Transport in Periphery and Risk Factors of Neonatal Mortality among Referred Newborns. J Pharm Biomed Sci. 2012;16(16):3.

16. District Fact Sheet Agra Uttar Pradesh . [Accessed on 2018 Sept 30]. Available from: http://rchiips.org/NFHS/FCTS/UP/UP_Factsheet_146_Agra.pdf

17. Saini AG, Bharti B, Gautam S. Healthcare Behavior and Expenditure in an Urban Slum in Relation to Birth Experience and Newborn Care. J Trop Pediatr;58(3):214–9.

18. Kotwal YS, Jan FA, Yatoo GH, Kotwal S. Neonatal profile and outcome of the neonates admitted in NICU: A hospital based prospective study. Int J Sci Res. 2018;7(5):98–101.

19. Rao SK, Bajaj N, Rawat A. Pre Transport Factors and Transport Quality affecting the Neonatal Outcome. J Evol Med Dent Sci .2015;4(12):1991–5.

20. Sampathkumar P, Gobinathan S. A study on status of neonatal transport to a level III neonatal intensive care unit.Int J ContempPediatr 2018;5:1040-3.

21. Jeganathan S, Ravikmar SA, Tamilmani A, Parameshwari P, Chinnarajalu AV, Kolkar YB. Neonatal mortality of sick newborns admitted in a tertiary care teaching hospital in Tamil Nadu, South India. Int J ContempPediatr 2017;4:399-402.

22. Verma J, Anand S, Kapoor N, Gedam S, Patel U. Neonatal outcome in new-borns admitted in NICU of tertiary care hospital in central India: a 5-year study. Int J ContempPediatr 2018;5: 1364-7.

23. Rathod D, Adhisivam B, Bhat BV. Transport of sick neonates to a tertiary care hospital, south India: Condition at arrival and outcome. Trop Doct. 2015;45(2):96–9.

24. Dwivedi K, Prakash S, Parveen K, Shaikh S. Survival outcome of neonates admitted at government and private neonatal intensive care units of Allahabad, India. Int J Community Med Public Health 2017;4:2389-94.

25. Prasad V, Singh N. Causes of morbidity and mortality in neonates admitted in Government Medical College, Haldwani in Kumaun Region (Uttarakhand) India. J Pharm Biomed Sci.2011;8(8):1-4

26. Rakholia R, Rawat V, Bano M, Singh G. Neonatal morbidity and mortality of sick newborns admitted in a teaching hospital of Uttarakhand. CHRISMED J Health Res 2014;1:228-34.

27. Waiswa P, Kallander K, Peterson S, Tomson G, Pariyo GW. Using the three delays model to understand why newborn babies die in eastern Uganda. Trop Med Int Heal. 2010;15(8):964–72

28. Jajoo M, Kumar D, Dabas V, Mohta A. Neonatal transport: The long drive has not even begun. Indian J Community Med 2017;42:244-5.

29. Dalal E, Vishal G, Solanki D. Study on Neonatal Transport at Tertiary Care Centre. Int J Sci Res. 2013;2(12):289–92.

30. Shalini B, Nikhila C V, Alimelu M. Pre-Admission Factors Influencing Neonatal Mortality. J Dent Med Sci. 2017; 16(11):13–9.

31. Parekh ZR, Bharadwaj R, ParmarG,Shah A. Study of Referral Pattern of Neonates at Tertiary Care Centre and Role of TOPS Score in Assessing Morbidity and Mortality. Natl J Community Med 2018; 9(3):157-160

32. Shah HD, Shah B, Dave PV, Katariya JB, Vats KP. A step toward healthy newborn: An assessment of 2 years' admission pattern and treatment outcomes of neonates admitted in special newborn care units of Gujarat. Indian J Community Med 2018;43:14-8.

33. Narayan R, Singh S. A study of pattern of admission and outcome in a neonatal intensive care unit at Rural Haryana, India.Int J Pediatr Res. 2017;4(10):611-616.

34. Raikwar P, Parihar D, Batra APS, KaurJ,Juneja P, Kak I. A study of neonatal admission pattern and outcome from rural Haryana.Glob J Res Anal. 2018;7(February):73–5.

35. Modi R, Modi B, Patel JK, Punitha KM. Study of the Morbidity and the Mortality Pattern in the Neonatal Intensive Care Unit at a Tertiary Care teaching Hospital in Gandhinagar District, Gujarat, India. J Res Med Den Sci 2015;3(3):208-12.

36. Gandhi SJ, Godara N, Modi A, Kantharia SL. Newborn care practices of mothers in rural area of Navsari district. Int J Med Sci Public Health 2014;3:1320-1324.

37. Kumaravel K. S, Ganesh J, Balaji J, Pugalendhiraja K. V, Ramesh Babu B. "A Study on Impact of NRHM on Neonatal Care and Clinical Profile of Neonates Admitted in a SNCU of a Rural Medical College". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 82, October 12; Page: 14335-14347.

38. Reshma, Sujatha R. Cultural Practices And Beliefs On Newborn Care Among Mothers In A Selected Hospital Of Manglore Taluk. Nitte Univ J Heal Sci. 2014;4(2):21–6.

Epidemiological Study of Malaria in an Urban Corporation Area

Anjali Modi[1], Sukesha Gamit[1], K G Vaishnav[2], Abhay K Kavishvar[3], Ashish Naik[4], J.K. Kosambiya[5]

[1]Assistant Professor, [3]Associate Professor, [5]Professor and Head, Department of Community Medicine, Government Medical College, Surat, Gujarat, India

[2]Insecticide Officer, [4]Dy. Commissioner (Health and Hosp.), Surat Municipal Corporation, Surat,Gujarat, India

Correspondence : Dr Sukesha P Gamit, E mail: sukeshagamit@yahoo.com

Abstract :

   Introduction: Malaria response and preparedness planning requires early warning signs, determination and declaration of epidemic as it is a major public health problem in South Gujarat and country. **Objective:** To verify, investigate and supervise the malaria epidemic situation in 2015 in an urban corporation area. **Method:** This was a mixed-methods study conducted in the seven administrative zones of Surat Municipal Corporation (SMC)in 2015.Field visits were conducted to explore increase in number of malaria cases and factors responsible. Microscopic diagnosis of parasite in blood slides followed by calculation of malariometric indices was the main study tool.For epidemic declaration, WHO recommended threshold methods-(1) monthly mean plus twice standard deviation (SD) (2) 3rd quartile (3)Cumulative Sum+2SD; were used. **Results:** Among 5,084,688 population of SMC in 2015; 1,272,888 slides were examined with 8708 malaria positive, slide positivity rate (SPR) 0.65 and PF rate 16.1%. Epidemic thresholds constructed from previous year (2010-2014) data were not crossed, though maximum cases were reported during monsoon months.Migration, massive construction activities and simultaneous epidemic of influenza led to development of favourable malariogenic conditions in East, North and South-east zones. Radical treatment and follow-up of malaria cases suffered among the highly mobile population of construction workers leading to high malaria parasite load in community. **Conclusion:** Urban Surat malaria cases have increased especially in South-east, North and East Zones, but not crossed epidemic threshold in year 2015.Epidemic investigation step-wise approach of identifying areas of active malaria transmission may help program managers to plan and stratify control responses in a resource- constrained setting.

Key Words : Construction Workers, Epidemic threshold, Urban Malaria

Introduction :

   Malaria is one of the major global public health problems[1] , with nearly half of the world population at risk, 216 million cases and 0.45 million deaths. India is one of the sixteen countries which together contribute 80 % global malaria burden.[2, 3] Any epidemic of vector-borne disease of malaria generates huge public attention and panic in population. Regular surveillance of the disease related situation helps in early epidemic detection and planning of prevention and control measures. [4]

   A malaria epidemic can be described simply as a sharp increase in the frequency of malaria transmission that exceeds by far the inter-seasonal variation normally experienced. Early detection of

Epidemic involves recognizing the beginning of an epidemic situation by measuring changes in local disease incidence.[5] Conventionally, this expected frequency for any month is considered as two standard deviations above the monthly mean calculated from previous three years data.

   To summarise, epidemic detection algorithms are increasingly recommended by WHO and reputed researchers for malaria surveillance.[6] In India, the surveillance data is rarely used for epidemic detection, early warning system, planning malaria response and reallocation of resources. The present study aims to detect the epidemic situation of malaria in an urban corporation area of Gujarat. We envisage that findings will enable the program managers and

policy makers to make use of routine data from surveys for planning various prevention activities.

Method:

Study settings: Surat city is a large metropolitan city situated on western coast of India in the state of Gujarat.[7] The Surat Municipal Corporation (SMC) has 7 administrative zones and a separate department for vector borne disease control program (VBDCP) implementation.

Study Variables: The peripheral blood smears of suspected cases were examined microscopically for malarial parasite. The indicators recorded were blood smears collected and examined in city population, total blood slides positive for Plasmodium vivax and Plasmodium falciparum. This information was used to calculate the following malariometric indices; Blood smears examined (BSE) Annual Blood Examination rate (ABER)= (BSE/Population/10), Slide positivity rate (SPR) is proportion of positive slides out of total blood smears examined, Slide falciparum rate (SFR) is proportion of positive p. falciparum slides out of total blood smears examined, Annual Parasite Incidence (API) is proportion of positive infections in the population examined and Annual Falciparum Index (AFI) is proportion of falciparum positive and mixed infections in the population examined.[8]

Study duration: The data collection for this study was done from January 2015 to December 2015. Analysis and preparation of report was done in 2016. Historical data of malaria cases over 5 years (2010-2014) was used to calculate the monthly epidemic threshold to compare the trend of cases in year 2015.

Study Methods: This study was a mixed methods study conducted as step-wise investigation of epidemic.

First, a secondary data analysis was conducted from the information collected by malaria surveillance workers called as peripheral health workers (PHWs) in Surat city. Secondly, city areas with increasing malaria cases were identified by desk review and interviews of malaria officers of city. Thirdly, field visits to study factors responsible for increase in cases were explored.

Malaria surveillance system is well developed in urban Surat and consists of active, passive and mass surveys during epidemic.[9] There are tiers of government funded health care system; (44 urban health centres and medical college as reference centres) and various private hospitals which contribute to passive surveillance of malaria in city.[9,10] The population of each urban zone is further segmented into sections of ten thousand populations (2000 households which are actively surveyed) by one designated peripheral health worker (PHW). For active surveillance, the PHWs conduct house to house fever survey in such a way that each household is visited at least twice in a month.[3,9] The VBDCP related activities of each zone is supervised by Sanitary Inspectors, Assistant Insecticide officers, Medial Officers and Medical Officer of Health. Malaria is a notifiable disease in Surat city.[11] Peripheral blood smears were collected from suspected malaria fever cases for examination by microscopy. In case microscopy was not possible within 24 hours, then rapid diagnostic kits (RDKs) were used for malaria diagnosis according to national guidelines.[12] All cases were later confirmed by blood smear examination.

The historic monthly data of malaria cases over the previous 5 years (2010-2014) was obtained. To determine the epidemic monthly threshold, following three different methods recommended by WHO were employed to calculate alert levels.[2,4,6,11]

(1) The monthly mean (n=5) plus twice standard deviation method. The alert threshold for each month is determined as the mean plus 2 times the standard deviation.[13]

(2) The 3rd quartile method: the alert threshold is reached when current cases exceed the upper 3rd quartile or the "upper normal limit. For 5 years of observations, quartile 0 is the minimum, quartile 1 the second lowest, quartile 2 the median, quartile 3 the second highest and quartile 4 the maximum value of the series for any given month.[4]

(3) The C-SUM (Cumulative Sum+2SD) mean calculated over the combined previous, current and following months' data for the past 5 years (n=15). For example the expected number of

cases for any month would be derived from the average of 3 months (current, previous and next month) cases over last 5 years (n=15). Then the malaria cases in a particular month of 2015 were plotted on the threshold to ascertain whether an epidemic response was warranted or not.

Ethical clearance: As recommended by WHO ethical guidelines for public health research and surveillance, ethical waiver can be obtained for activities done under implementation of national health programs.

Results:

The year wise consolidation of reports of malaria surveillance showed that in 2015, among 5,084,688 people of SMC, 1,272,888 slides were examined and 8708 had malaria positive. Plasmodium falciparum (PF) were found in1400 slides out of 8708 (16.07%). The ABER of the city was 25% (1,272,888/5,084,688 *100); API of 1.71; SPR of 0.68 and PF 16% (table 1).Compared to this in 2014, among the 4,891,945 population of SMC, 1,286,559 slides were examined with 7110 total positive slides (P. Falciparum was positive in 1038 slides). The ABER was 26% (1,286,559/4,891,945 *100); API of 1.55; SPR of 0.55 and PF 14.6%. Compared to 2014, there was rise of 34.9% in number of malaria cases in year 2015

Maximum cases were seen in the East followed by North and South-East zones.Out of total 8,708 malaria cases up to September in 2015, 1400 (16%) were Pf cases. The east, north and south east zones of the city constitute 70% malaria burden. Males bear 70% malaria burden of city. Compared to the year 2014, there is increase in cases of Pv and Pf malaria for all the zones except SEZ.The trend is on higher side but it does not cross the epidemic threshold level for epidemic of malaria when compared with last five years data.

Month wise Malaria surveillance data (2010 - 2015) is presented in table 2. For calculating the epidemic threshold, we used last five years malaria surveillance data (Figure 1). According to method I, the mean and twice the standard deviation of last five year data were added to calculate the level of epidemic threshold for each month.The number of cases for all the months in 2015 was below the epidemic threshold (Figure 2).However, the year-to-year variability was marked during the monsoon season (Aug-Sep), which lead to wider 95% confidence intervals in the epidemic threshold curve during these months. According to method II, the last five year data were arranged month-wise in ascending order and middle values were used to construct the third quartile (Figure 1).In year 2015, the number of cases does not exceed the 3rd quartile for any month as shown in figure 2 also.

Using the method III, the 3-months' moving average over past 5 years called as cumulative sum (C-SUM) was compared with study year 2015. For C-SUM example, the expected number of cases for January 2015 was derived from the average of December, January and February admissions from 2010 to 2014 inclusive (n=15).

Above exercise of comparison of number of cases in year 2015 with last five year malaria cases suggests that there was no increased epidemic activity. The malaria health problem in area was below expected frequency.

For year 2015, malaria cases are below the epidemic monthly threshold; prepared on historical data of 2010-2014.

In the third part of the study, field visit was done to health centers showing increase in number of malaria cases. The findings were: 1) There was a swine flu epidemic along with malaria cases in Surat city. 2) Out of the required 488 workers nearly half posts were vacant. 3) Workers have to work for NVBDCP as well as swine flu so there was disturbance of routine activity like, anti-larval and anti-adult measures. The swine flu cases were also found in maximum numbers in the same zones where more cases of malaria were seen. 4)We also observed that it was very difficult to ensure compliance to Radical Therapy in migratory population due to non-availability of permanent address and contact details. These patients may later suffer from malaria and also serve as reservoirs of infection for other population.

Discussion:

The present study shows that the annual blood examination rate (ABER) for all the 7 zones of SMC is 20.4% well above the recommended level of 10% of

Table 1: Zone-wise distribution of malaria cases in year 2014 and 2015

Zone wise data	Year	Total PV	Total PF	Total Positive	Pf %	Change
Central Zone	2014	602	135	737	18.3	+41.18%
	2015	555	177	732	24.18	
West Zone	2014	319	46	365	12.6	+119%
	2015	311	101	412	24.51	
South Zone	2014	421	54	475	11.37	+20.3%
	2015	445	65	510	12.75	
South East Zone	2014	1545	282	1827	15.44	-6.4%
	2015	1523	264	1787	14.77	
South West Zone	2014	297	56	353	15.86	+30.4%
	2015	281	73	354	20.62	
North Zone	2014	1180	212	1392	15.23	+40.6%
	2015	1530	298	1828	16.3	
East Zone	2014	1708	253	1961	12.9	+57.3%
	2015	2663	422	3085	13.68	
Total	2014	6072	1038	7110	14.6	+34.9%
	2015	7308	1400	8708	16.08	

Table 2: Month wise Malaria surveillance data (2010 - 2015)

	2010	2011	2012	2013	2014	2015	Mean	SD
JANUARY	289	491	418	233	270	178	340.2	109.34
FEBRUARY	278	333	326	273	276	171	297.2	29.62
MARCH	351	385	398	363	320	249	363.4	30.41
APRIL	543	624	665	658	442	373	586.1	94.14
MAY	718	744	781	706	684	520	726.6	37.31
JUNE	570	875	886	820	607	723	751.6	151.38
JULY	1174	1300	1376	1114	774	1306	1147.6	232.79
AUGUST	2526	1793	1703	1489	902	1472	1682.6	585.38
SEPTEMBER	2558	2538	2048	1430	1362	1733	1987.2	577.53
OCTOBER	2116	1883	1696	895	937	1344	1505.4	558.43
NOVEMBER	1427	819	959	813	667	639	937	292.72
DECMBER	1043	584	385	415	496	390	584.6	267.66
Total						9098		

Figure 1: Epidemic Threshold calculated from five year malaria cases data using the three methods recommended by WHO

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3rd quartile	418	326	385	658	744	875	1300	1793	2538	1883	959	584
C-SUM	407	334	416	559	688	875	1194	1606	1725	1477	1009	621
mean+2SD	559	356	424	775	801	1055	1613	2853	3142	2622	1522	1120
C-SUM+1.96SD	806	469	689	882	929	1364	2223	2745	2842	2726	2061	1278

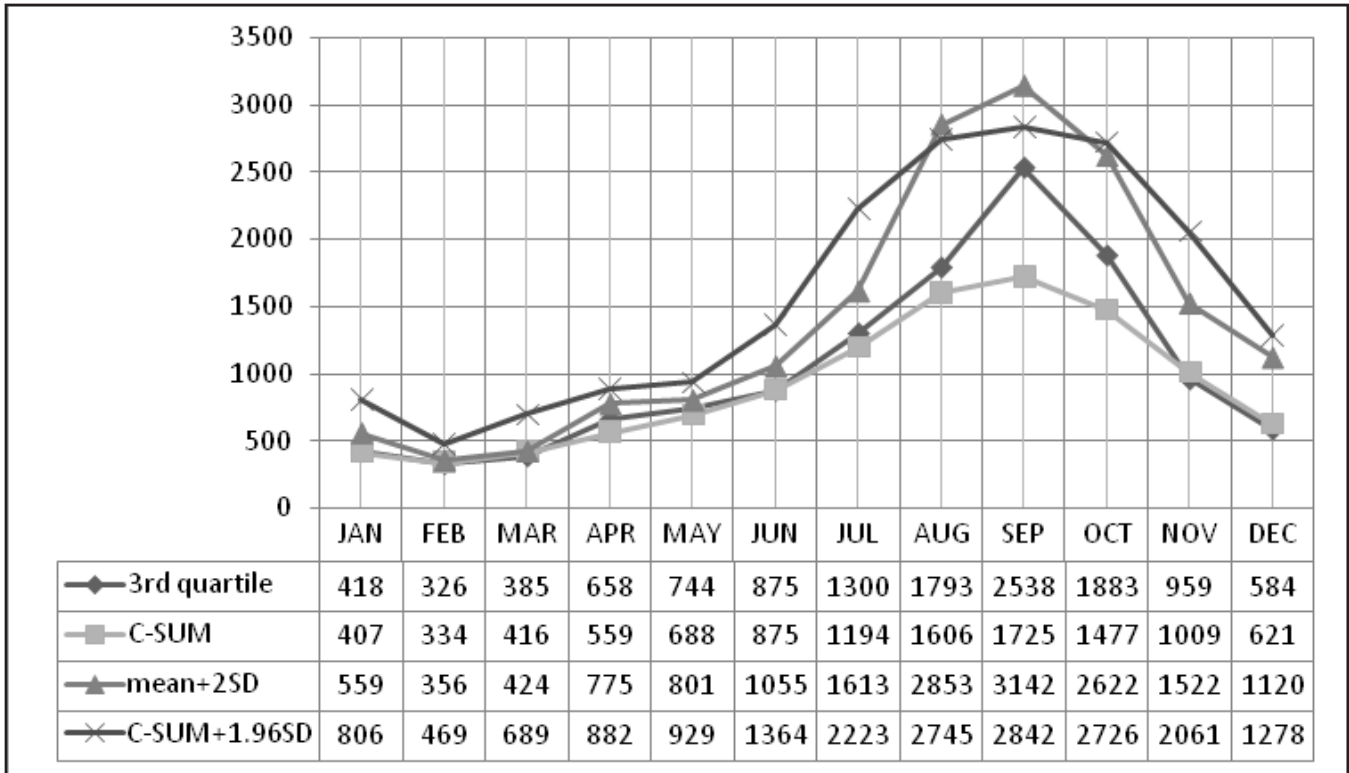**Figure 2: Line diagram of malaria cases of year 2015 compared with three methods Epidemic Threshold calculated as per WHO**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3rd quartile	418	326	385	658	744	875	1300	1793	2538	1883	959	584
C-SUM	407	334	416	559	688	875	1194	1606	1725	1477	1009	621
mean+2SD	559	356	424	775	801	1055	1613	2853	3142	2622	1522	1120
C-SUM+1.96SD	806	469	689	882	929	1364	2223	2745	2842	2726	2061	1278
2015	178	171	249	373	520	723	1306	1472	1733	1344	639	
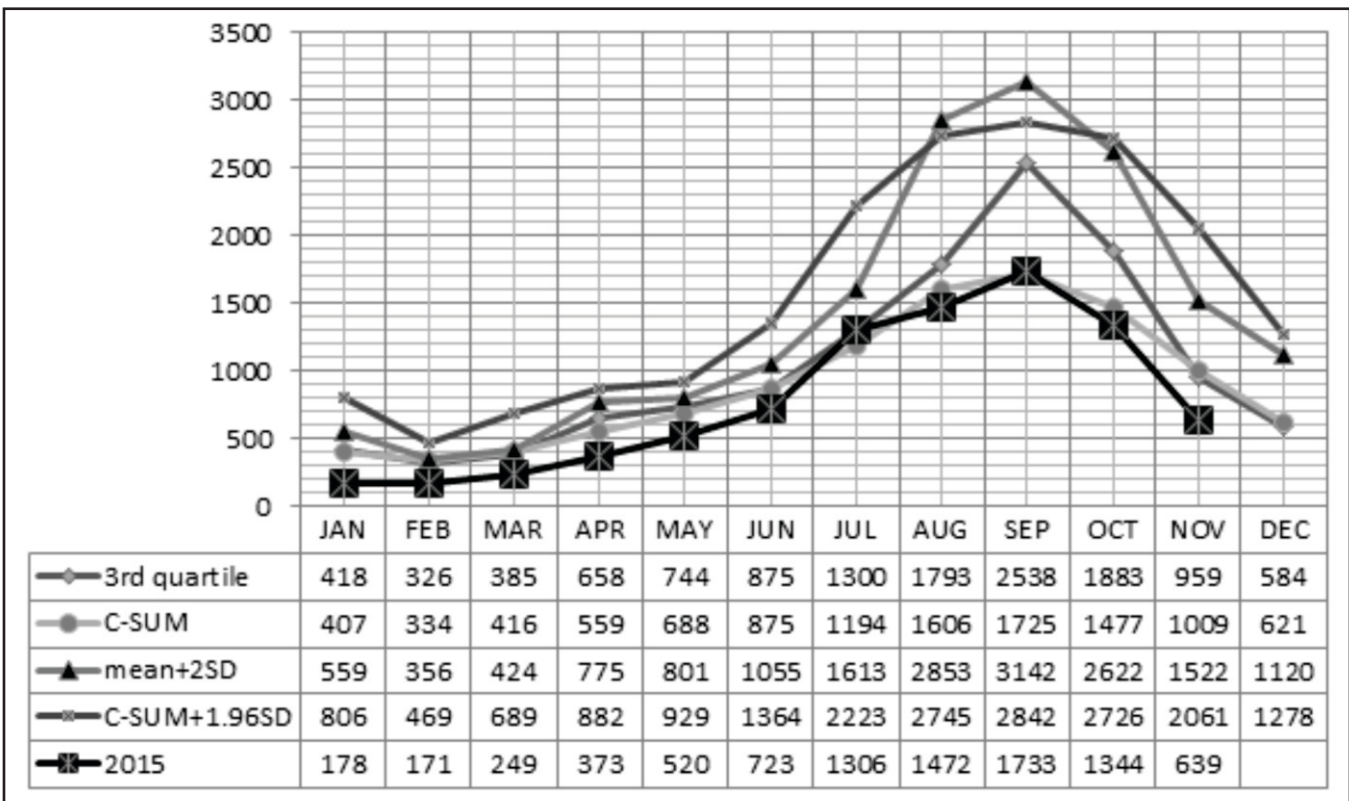
total population denoting efficacy of malaria surveillance program in city.[8] SPR has been falling consistently over the last five years. The malaria cases included for present communication were reported by active as well as passive surveillance on a regular basis as per guidelines of Urban Malaria Scheme (UMS). Malaria cases increased in year 2015 but malariometric indices does not show much change or rising trend over the years suggesting the need of present epidemiological study before verifying the epidemic declaration in urban Surat (Table 1). The SPR in our study was 0.65, as compared to the national average of 0.97 which again suggests that epidemiological situation in Surat is below epidemic threshold.

On field investigation we found that migration, massive construction activities and simultaneous epidemic of influenza led to development of favourable malariogenic conditions.Unplanned expansion of city structures leads to a host of problems including weak health infrastructure, inadequate housing, poor water supply, and overcrowding leads to increase in malaria transmission in urban areas has been proven by established research.[3,7]

In the present study the PF % was 16% which was much lower than similar study done in Surat where Pf prevalence was found to be 26.1% with peak prevalence between the months of Aug-Nov.[12, 14] This difference can be explained by the fact that the latter were hospital based studies, and present study had analysed data mainly from active and passive case detection by field surveillance.

Epidemic early detection involves recognizing the beginning of an epidemic situation by measuring changes in local disease incidence. Although this surveillance mechanism offers little lead time (days to weeks) for preparation and implementation of preventive measures, it can lead to a rapid and effective response to avert or reduce peak morbidity and mortality. In current study, we used the WHO recommended and senior malaria researchers suggested field guide and epidemic threshold construction methods to estimate the situation of

malaria epidemic in urban area of Surat.[13] Advantage of C-SUM method is that it smoothens artificial variations in monthly reported data that are due to late reporting and other errors inherent to the surveillance system.Another method which can be used to find epidemic threshold in which SPR exceeds by 2 times of the standard deviation observed in SPR of the preceding 3 years or 3 months of the same year.The sensitivity of Methods I(Mean + 2 SD) and III (C-SUM + 1.96 SD) were adversely affected by large year-to-year differences observed during monsoon monthsgiving a very wide 95% confidence interval and high threshold level in present study similar to other studies.[4, 6, 13, 14] According to this study, the most practical method is determination of epidemic threshold by plotting the median and third quartile of malaria incidence every calendar month of previous years.

This study also suggests that continuous vigilance and supervision of malaria surveillance is required and cases should be analysed every week to avoid missing epidemic warning signs. The vacant posts of surveillance workers or their employment in other works seriously jeopardized the malaria situation in this study leading to 34% increase in cases in year 2015. The up scaling of monitoring, supervision and involvement of less qualified local health care providers and community volunteers in malaria control program has been suggested by other important studies in this field also.[15]

Conclusion:

In summary, our study suggests that epidemiological verification of malaria in an urban area should be done with epidemic threshold calculated from last five years data. This should be followed by identification of factors responsible and areas having increased cases and field visits to ensure effective surveillance by malaria workers and implementation of Urban malaria Scheme (UMS). Our study concludes that though the urban Surat does not has malaria epidemic in year 2015, control response are required due to unplanned expansion, migration and increasing trend of cases in city especially in South-east, North and East Zones.

Recommendation:

For investigation of epidemic situation in an urban area; the first step should be construction and comparison with epidemic threshold using WHO recommended methods allowing minimum bias in epidemic assessment. This should be further strengthened by field visits of health centres and areas showing increasing trend of cases. Health workers should be trained to plot malaria cases in this graph on weekly basis. When cases are in excess of the median, a report should beprepared and notification sent immediately to concerned authorities for planning epidemic response and prevention control activities. To conclude, for achieving an effective response Malaria Early Warning System must be an integral part of the national and district-based malaria epidemic preparedness plan.

Limitations:

The epidemic thresholds were calculated using only last five year retrospective data, considered less valid for long-term fluctuations. Historical data should have been collected right from the beginning of surveillance systems. Application of currently recommended epidemic detection algorithms in epidemic-prone settings has demonstrated that they lack required sensitivity and specificity, and the need to develop robust and reliable approaches to detection remains a significant research issue.

Scope for future research:

There is a need to develop statistical models of malaria early warning system taking into account climatic, environmental and host factors. Use of Geographical Information Sutem, (GIS), Autoregressive Integrated Moving Average (ARIMA) andnewer modalities for malaria modelling is a significant research prospect.

Declaration:

Funding: Nil

Conflict of Interest: Nil

References:

1. Paul RE, Ding G, Gao L, Li X, Zhou M, Liu Q, et al. A Mixed Method to Evaluate Burden of Malaria Due to Flooding and Waterlogging in Mengcheng County, China: A Case Study. PloS one. 2014;9(5):e97520.

2. World Health Organisation. World Malaria Report 2017. WHO Global Malaria Programme and WHO Public Health Information and Geographic Systems. Geneva2017.

3. Wangdi K, Gatton ML, Kelly GC, Banwell C, Dev V, Clements ACA. Malaria elimination in India and regional implications. Lancet Infect Dis. 2016 Oct;16(10):e214-e224.

4. Hay SI, Simba M, Busolo M, Noor AM, Guyatt HL, Ochola SA, et al. Defining and Detecting Malaria Epidemics in the Highlands of Western Kenya. Emerging infectious diseases. 2002;8(6):555-62. PubMed PMID: PMC2738480.

5. Abeku TA, Hay SI, Ochola S, Langi P, Beard B, de Vlas SJ, et al. Malaria epidemic early warning and detection in African highlands. Trends in parasitology. 2004;20(9):400-5.

6. Organisation WH. Field guide for malaria epidemic assessment and reporting- Draft for field testing. WHO/HTM/MAL/20041097.Geneva2004.

7. Surat Municipal Corporation. Vector Borne Disease Control Program Annual Report 2016. Surat: Suart Municipal Corporation, 2016.

8. Cohen AA, Dhingra N, Jotkar RM, Rodriguez PS, Sharma VP, Jha P. The Summary Index of Malaria Surveillance (SIMS): a stable index of malaria within India. Population Health Metrics. 2010;8(1).

9. Anvikar AR, Shah N, Dhariwal AC, Sonal GS, Pradhan MM, Ghosh SK, et al. Epidemiology of Plasmodium vivax Malaria in India. The American journal of tropical medicine and hygiene. 2016;95(6 Suppl):108-20.

10. Kumar A, Valeca N, Jain Ta, Dash AP. Burden of malaria in India. The American journal of tropical medicine and hygiene. 2007;77(Suppl 6):69-78.

11. World Health Organisation. Epidemiological approach for malaria control – 2nd ed. Malta: World Health Organisation, WHO; 2013.

12. Directorate of National Vector Borne Disease Control Program DGHS. National-Drug-Policy-2013. New Delhi: Director Journal of Health Services, Ministry of Health and Family Welfare, India.; 2013.

13. Cullen JR, Chitprarop U, Doberstyn EB, Sombatwattanangkul K. An epidemiological early warning system for malaria control in northern Thailand. Bulletin of the World Health Organization. 1984;62(1):107-14. PubMed PMID: PMC2536271.

14. Kevadiya S, Patel M, Modi J, Gamit B, Patel P, Padsala S. Characteristic and trends of malaria in Surat district of Gujarat: a hospital based study. International Journal of Research in Medical Sciences. 2014;2(1):151.

15. Das A, Ravindran TKS. Factors affecting treatment-seeking for febrile illness in a malaria endemic block in Boudh district, Orissa, India: policy implications for malaria control. Malaria journal. 2010;9(377).

Economic Dependence, Psychosocial Status and Morbidity Pattern of Elderly in Udaipur, Rajasthan, India

Mohnish N. Tundia[1], Dhara V. Thakrar[1], Bhanwarlal Vyas[2], Shashikant Nagaonkar[3], Abhilasha Mali[4]

[1]Assistant Professor, [2]Professor, [3]Professor and Head, [4]Statistician, Community Medicine Department,
American International Institute of Medical sciences, Udaipur, Rajasthan, India
Correspondence : Dr. Dhara V. Thakrar, E mail: drdharathakrar@gmail.com

Abstract :

Introduction: The proportion of the world's population aged 60 years or over increased in last four decades. Poor health care add to the degree of disability among the elderly which may leads to social isolation and psychological problems. The old age dependency ratio is also showing an upward trend in India. **Objectives:** To find out the economic dependence, psychosocial status and morbidity pattern in elderly. **Method:** A cross-sectional study was conducted from September to November 2018 at the field practice area of rural health training center situated at Chhota-guda, Udaipur, Rajasthan with sample size of 400. Elderly persons aged 60 years and above were interviewed. **Results:** Out of total unemployed elderly, 80.78% were financially dependent. In this study, 46.44%, 55.33%, 31.25% and 19.75% elderly felt neglected, burden to family, lonely and depressed respectively. 74% had chronic morbidities during the study period. Among elderly having morbidity, 52.70% sought health advice and treatment. **Conclusion:** Joint pain was found to be the most common morbidity. Health-seeking behaviour was shown more by elderly males with statistical significance. Elderly educated up to middle schools demonstrated highest seeking towards healthcare but was not statistically significant. Employment status of elderly was not found to be associated significantly with their health-seeking behaviour.

Key Words : Dependency, Elderly, Morbidity, Psychological

Introduction :

The world's population is ageing. The proportion of the world's population aged 60 years or over increased from 8 per cent in 1950 to 12 per cent in 2013. It will increase more rapidly in the next four decades to reach 21 per cent in 2050. In the least developed countries, the proportion of older persons has remained fairly stable at about 5 per cent for many decades, but this proportion is expected to double by 2050. [1]

With the decline in fertility and mortality rates accompanied by an improvement in child survival and increased life expectancy, there is progressive increase in the number of elderly persons found. Increasing life span and poor health care add to the degree of disability among the elderly and compound the problems of care giving. [2]

Public interest in aging has increased not only because all of us can expect to live to a ripe old age but also because we wish to avoid those age-related changes that lead to physical invalidity or other diseases and may ultimately cause social isolation. [3]

With a comparatively young population, India is still poised to become home to the second largest number of older persons in the world. Projection studies indicate that the number of 60+ in India will increase to 100 million in 2013 and to 198 million in 2030. Majority of them are in the rural areas, thus making service delivery a challenge. Feminization of the elderly population, increase in the number of the older-old (persons above 80 years) and percentage of the elderly below poverty line are also serious issues. [4]

The old age dependency ratio (12%) is also showing an upward trend in India. The sex ratio for elders continues to rise to become as high as 136 women per 100 men by 2026. This trend poses more specific challenges relating to very old-widowed women. High levels of illiteracy, particularly among older women in rural areas, are yet another aspect of vulnerability for senior citizens in India. [5]

In India, major illnesses of elderly include communicable as well as non-communicable diseases; hearing, visual impairment and loco-motor disabilities also contribute a major chunk. The prevalence of heart diseases was found to be more among elderly people living in urban areas, they are also more prone to mental morbidities due to breakdown of social and family structures and changes associated with rapid urbanization. [6]

As populations grow older, it is more important than ever that Governments design innovative policies and public services specifically targeted to older persons. [7] So, there is a great need of country-specific studies of health and social problems in the elderly to design such policies.

Looking at current scenario, our study will highlight level of problems of elderly and thus will help to the health planner and policy makers to channelize resources to address these problems at community level. This study will also provide evidence about psychosocial status, morbidity pattern and economic dependence of elderly which will help to set up a framework for further researches into health care of elderly. The data of this study will help to obtain baseline measures for assessment of future studies.

Objectives:

- To determine economic dependence of elderly
- To study psychosocial status of elderly
- To find out the morbidity pattern in elderly

Method:

With prior permission from Ethical committee, a cross-sectional, descriptive study was conducted at the field practice area of rural health training center (RHTC) situated at Chhota-guda, Udaipur, Rajasthan from September to November 2018. The RHTC is managed by Community Medicine department, American International Institute of Medical Sciences, Udaipur. The study center with approximate population of eight thousand three hundred, is located 10 km from the college. As of 52% prevalence rate(p) taken from previous study,[12] a sample size of 369 was reached by using an appropriate statistical formula n= 4pq/d2 (n=sample size, q=100-p=48 and

d=allowable error, which is taken 10% of p). To overcome non response rate, recall bias and sampling error, current study has taken final sample size of 400. Elderly persons aged 60 years and above who were permanent residents of the area and gave informed consent to be part of our study were eligible to participate in our study. Those geriatric people who were not permanent residents of the area, who did not give consent to participate, and those critically ill elderly who were unable to respond to interview schedule were excluded from the study. Systematic random sampling technique was followed to choose a sample by taking every 20th house (As the approx. population of study area was 8300 and calculated sample size was 400). Modified Prasad Socio-economic Categorization Status Scale was used to categorize the socio-economic status of the family (AICPI-307, January 2019: Base year 2001=100).A pretested semi-structured proforma was used to collect data by a trained health professional after obtaining informed consent. Geriatric Depression Scale 15 (GDS 15) was used to measure depression level in elderly.[13]A Short Form GDS is a 15 item questionnaire in which participants are asked to respond by answering yes or no in reference to how they felt over the past week. Scores of 0-4 are considered normal, 5-8 indicate mild depression; 9-11 indicate moderate depression; and 12-15 indicate severe depression.

Data entry and analysis were done using software Epi info 7. Chi-square statistical tests were used to find out association.

Results:

Table-I, Shows analyzed the socio-demographic profile of the respondents. Out of the 400 elderly interviewed, 168 (42%) were male while 232 (58%) were female. Most of them (36%) were in the age group of 65–69 years. Most of the respondents were educated up to primary school only while 30.75% were illiterate. Out of 400 elderly, 228 (57%) were married and 4 (1%) were unmarried. We found that 31.25% of elderly were staying alone, 49.75% were in joint families, and the rest 19% were in nuclear families. In our study, most elderly (58.50%) belonged to middle socioeconomic status. We observed that 76.75% elderly were unemployed.

Table 1: Socio-demographic characteristics of elderly

Characteristics	Frequency	Percentage
Gender		
Male	168	42.00
Female	232	58.00
Age (Years)		
60-64	108	27.00
65-69	144	36.00
70-74	89	22.25
75 or more	59	14.75
Education		
Illiterate	123	30.75
Primary school	135	33.75
Middle school	86	21.50
High school	41	10.25
Graduate and above	15	03.75
Marital status		
Married	228	57.00
Unmarried	04	01.00
Widow/Widower	165	41.25
Divorced/ Separated	03	0.75
Type of family		
Nuclear	76	19.00
Joint	199	49.75
Staying alone	125	31.25
Socio-economical class		
Class-1	15	03.75
Class-2	32	08.00
Class-3	234	58.50
Class-4	76	19.00
Class-5	43	10.75
Employment		
Paid work	67	16.75
Unemployed	307	76.75
Pensioner	26	06.50

In current study, it was observed that out of total unemployed elderly, 80.78% were financially dependent. (Figure-1)

**Figure 1: Economical dependence of unemployed elderly persons**
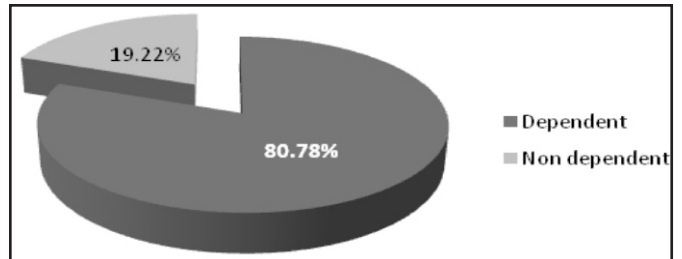
Out of 400 elderly, 6 had no family members. In current study 46.44% of elderly had felt 'neglected by family members'. Whereas, 55.33% of the subjects had felt 'burden to the family'. Loneliness was felt by 31.25% of elderly. As per Geriatric Depression Scale 15 (GDS 15), 19.75% elderly were having 'depression'. (Table-2)

Table 2: Psychological status of elderly

Variables	Frequency (%)
Feeling neglected by family members (n=394)	
Always	57(14.47)
Sometimes	126(31.97)
Never	211(53.56)
Feeling burden to the Family(n=394)	
Always	26(06.60)
Sometimes	192(48.73)
Never	176(44.67)
Feeling loneliness(n=400)	
Yes	125(31.25)
No	275(68.75)
Depression level (GDS 15 score)(n=400)	
No (0 – 4)	321(80.25)
Mild (5 – 8)	44(11.00)
Moderate (9 – 11)	27(06.75)
Severe (12 – 15)	08(02.00)

In current study the morbidity profile of elderly people was evaluated based on their history, clinical diagnosis, laboratory test reports, and doctor's prescriptions. It was found that out of 400 elderly people, 296 (74%) had chronic morbidities during the study period. Many elderly were suffering from multiple morbidities at the same time. Joint pain (56.25%) was found to be the most common morbidity followed by visual impairment (30.5%) and hypertension (26%). More women (56.44%) were suffering from arthritis than men. We did not consider any acute disease in our study. (Figure-2)

Figure 2: Distribution of elderly population according to Morbidity pattern
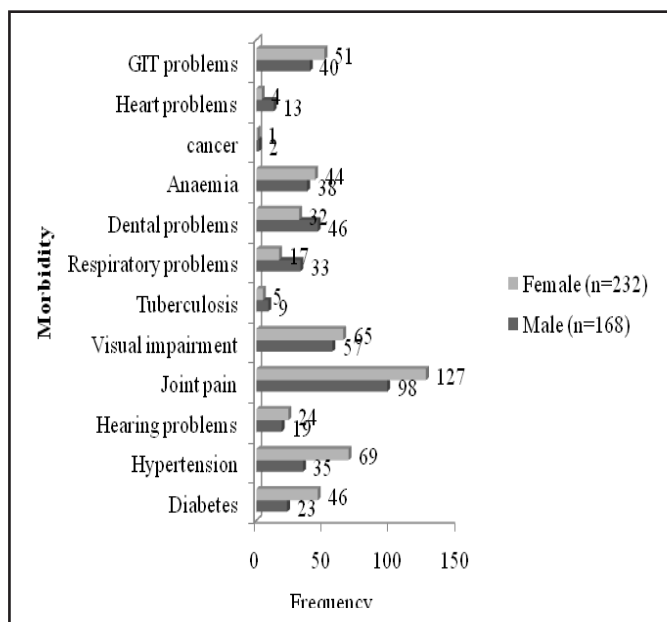
In figure-3 we analyzed the health-seeking behavior of all those elderly who reported having some morbidity or those diagnosed as having morbidity by the investigators. Among 296 elderly having some chronic morbidity, 156 (52.70%) sought health advice and treatment.

Figure 3: Health seeking behavior of elderly
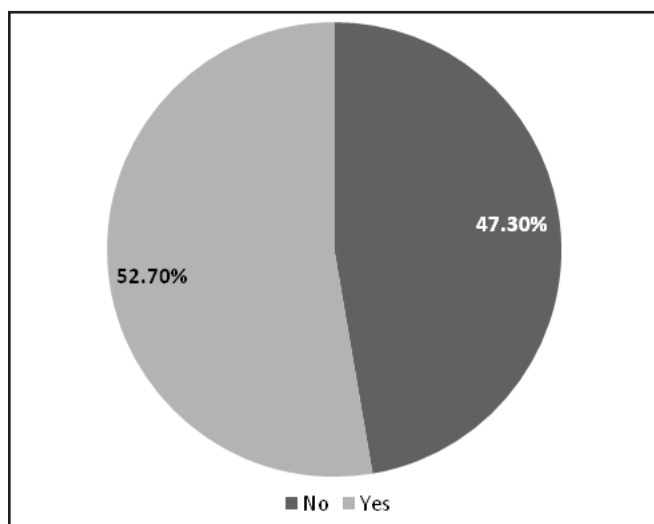
In our study, we analyzed different factors influencing health-seeking behavior of the elderly. Here, we found that health-seeking behavior was shown more by elderly males (62.61%) than females (47.08%). It was found to be statistically significant.

Those elderly educated up to middle schools, demonstrated highest (63.79%) seeking towards healthcare but was not statistically significant. On analysis of employment status of elderly and health-seeking behavior, we did not found significant association. (Table-3)

Discussion:

Advancing age is susceptible to numerous diseases especially the degenerative disorders. Females are the large disadvantaged group, who are one of the fastest growing segments and which will increase to become four times the current figure, by 2025. The challenge in the 21st century is to delay the onset of disability and ensure optimal quality of life for older people.[8, 9]

Out of total study subjects in current study, around one third was living alone which could be the reason for poor health seeking behaviour and psychosocial problems in elderly. According to a report in 2016 by Government of India, more than half number of elderly were living with their spouse, one third with their children and around 5% were living alone.[10] In our study we observed, out of total unemployed elderly, more than 80% were financially dependent on their respective families which could be the provoking factor for feeling of burden on family. This result was inconsistent with the findings of studies by Dahiya et al. [11] and Goel et al. [12] Whereas, it was found compatible with an observation of study by Barua K et al.[14]

Elders are in great need of care and support of family. Nearly one third of elderly were feeling loneliness in our study. This finding was almost similar to study by Prakash R et al.[15] It was found that around half of the subjects felt neglected by family members in our study. This finding was conflicting with result of study by Prakash R et al.[15] and it was found nearer to finding of study by Ribot V et al.[16] Studies from France[17] and Northern India[18] reported lower prevalence of depression as compare to our study, while it was noted higher in studies carried out in Western India.[19,20]

Joint pain (56.25%) was found to be the most common morbidity followed by visual impairment (30.5%) and hypertension (26%) in present study.

Table 3: Association of health seeking behavior of elderly with different variables

Variables	Elderly seeking healthcare (%)	Elderly having morbidity	Chi- square	P value
Gender				
Male	67 (62.61)	107	6.6077	p=0.010
Female	89 (47.08)	189		
Education				
Illiterate	43 (44.32)	97	6.0575	p=0.1948
Primary school	49 (55.05)	89		
Middle school	37 (63.79)	58		
High school	20 (50.00)	40		
Graduate and above	07 (58.33)	12		
Employment				
Paid work	18 (41.86)	43	2.5141	p=0.2844
Unemployed	130 (54.85)	237		
Pensioner	08 (50.00)	16		

(p<0.05 statistically significant)

Rent PD et al. in their study observed that problem of hypertension was seen in more than one third patients followed by diabetes (18.57%) and joint problems (14.42%).[21] George L et al. reported cataract and orthopedic problems in half of their study population. Whereas respiratory illnesses was the third most common chronic condition affecting almost one third subjects.[22] In a study from Northern India, anemia was found in almost two third elders followed by dental problems (63.0%), hyper-tension (49.0%) and chronic obstructive airway disease (42.0%).[23]

In our study, persons with education up to middle school were more conscious about their health comparatively. Significant association was found between gender and health seeking behaviour. Employment has also some impact on it in current study. Dey et al. in their article on health status of elderly in India observed that barriers, such as gender, religion, caste, socioeconomic status, social stigma, and economic dependence, hamper the access of elderly population to health-care services.[24] In present study health seeking behaviour was found in almost half of patients.Sharma D et al. in their study of morbidity pattern and health-seeking behavior of aged population residing in Shimla hills observed that nearly two third were seeking treatment for their health problems.[25]

Conclusion:

Joint pain was found to be the most common morbidity. Health-seeking behaviour was shown more by elderly males with statistical significance. Elderly educated up to middle schools demonstrated highest seeking towards healthcare but was not statistically significant. Employment status of elderly was not found to be associated significantly with their health-seeking behaviour.

Recommendations:

There should be provision of appropriate employment for the elderly to make them economically stable. Improvement in health seeking behaviour of elderly, especially females, is needed. Spreading of awareness regarding various government programmes and schemes for elderly person can also be fruitful.

Declaration:

Funding: Nil

Conflict of Interest: Nil

References:

1. New York: United Nations; 2013. United Nations, Department of Economic and Social Affairs, Population Division. World Population Ageing 2013; pp. 9–11.

2. Lena A, Ashok K, Padma M, Kamath V, Kamath A. Health and social problems of the elderly: A cross sectional study in Udupi taluk, Karnatka. Indian J Community Med. 2009;34:131–4. [PMC free article] [PubMed]

3. Rodríguez-Rodero S, Fernández-Morera JL, Menéndez-Torre E, Calvanese V, Fernández AF, Fraga MF. Aging genetics and aging. Aging Dis. 2011;2:186–95. [PMC free article] [PubMed]

4. New Delhi: Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India; 2012. Govt. of India. National Programme for the Health Care of the Elderly (NPHCE): An Approach towards Active and Healthy Ageing; pp-9.

5. Subaiya L, Bansod DW. New Delhi: United Nations Population Fund (UNFPA); 2011. Demographics of Population Ageing in India: Trends and Differentials, BKPAI Working Paper No. 1; pp 4-7.

6. Ingle GK, Nath A. Geriatric health in India: Concerns and solutions. Indian J Community Med. 2008;33:214–8. [PMC free article] [PubMed]

7. United Nations Population Division. World Population Ageing: 1950-2050. 2002. [Last cited on 2018 May 18]. Available from: http://www.un.org/esa/population/publications/worldageing19502050/pdf/7introduction.pdf .

8. Singh MM, Murthy GV, Venkatraman R, Rao SP, Nayar S. A study of ocular morbidity among elderly population in a rural area of central India. Indian J Ophthalmol. 1997;45:61–5. [PubMed]

9. Purty AJ, Bazroy J, Kar M, Vasudevan K, Veliath A, Panda P. Morbidity Pattern among the elderly population in the rural area of Tamil Nadu, India. Turk J Med Sci. 2006;36:45–50.

10. New Delhi: Central Statistics Office, Ministry of Statistics and Programme Implementation, Govt. of India; 2016. Govt. of India. Elderly in India - Profile and Programmes 2016; pp. 26–9.

11. Dahiya B, Ashwanti, Shahida P, Singh HP. Psycho-social factors affecting elderly persons in rural area of district Gurgaon, Haryana. Health Popul Perspect Issues 2011;34:223-31.

12. Goel PK, Garg SK, Singh JV, Bhatnagar M, Chopra H, Bajpai SK. Unmet needs of the elderly in a rural population of Meerut. Indian J Community Med 2003;28:165.

13. Sheikh JI, Yesavage JA. Geriatric Depression Scale (GDS): recent evidence and development of a shorter version. Clin Gerontol. 1986 June;5(1/2)):165-173.

14. Barua K, Borah M, Deka C, Kakati R. J Family Med Prim Care. 2017 Apr Jun;6(2):345-350. doi: 10.4103/2249-4863.220030.

15. Prakash R, Choudhary SK, Singh US. A Study of Morbidity Pattern among Geriatric population in an Urban area of Udaipur Rajasthan. Indian Journal of Community Medicine. 2004 Jan.-Mar.; 29(1).

16. Ribot CV et al. Psychological the Most Common Elder Abuse in a Havana Neighborhood. MEDICC Review, 2015 Apr;17(2):39-43. Tabue Teguo M

17. et al. Feelings of Loneliness and Living Alone as Predictors of Mortality in the Elderly: The PAQUID Study. Psychosom Med. 2016 Oct;78(8):904-909.

18. Behera P, Sharan P, Mishra A, Nongkynrih B, Shashikant, Gupta S. Prevalence and determinants of depression among elderly persons in a rural community from northern India. The National Medical Journal of India.2016 ;29(3):129-135.

19. Jariwala V, Bansal RK, Patel S, Tamakuwala B. A study of Depression among aged in Surat city. National Journal of Community Medicine. 2010; 1(1)

20. Narkhede V, Likhar S, Rana A. A study on depression in elderly inmates living in old age homes Gujarat. IJRRMS. 2012 Jul - Sep; 2(3):21-3

21. Rent PD, Kumar S, Dmello MK, Purushotham J. J Midlife Health. 2017 Oct- Dec;8(4):174-178. doi: 10.4103/jmh.JMH_46_17.

22. George LS, Deshpande S, Krishna Kumar MK, Patil RS. J Family Med Prim Care. 2017 Apr-Jun;6(2):340-344. doi: 10.4103/2249-4863.220025.

23. Joshi K, Kumar R, Avasthi A. Morbidity profile and its relationship with disability and psychological distress among elderly people in Northern India. Int J Epidemiol. 2003;32:978–87. [PubMed].

24. Dey S, Nambiar D, Lakshmi JK, Sheikh K, Reddy KS. Health of the elderly in India: Challenges of access and affordability.

25. Sharma D, Mazta SR, Parashar A. Morbidity pattern and health-seeking behavior of aged population residing in Shimla hills of North India: A cross-sectional study. J Family Med Prim Care. 2013;2:188–93.[PMC free article] [PubMed].

A Study on Screening for Depression among Inhabitants of Old Age Homes in Anand Taluka and Associated Epidemiological Determinants

Uday Shankar Singh[1], Tumul Nandan[2], Hemshree Parmar[2], Aanal A Bhoiwala[3], Aartiben V Jambu[3], Asmitaben J Parmar[3]

[1]Professor and Head, [2]Resident doctors, Department of Community Medicine, [3]Third MBBS Students
Pramukhswami Medical College, Karamsad, Gujarat

Correspondence : Dr. Uday Shankar Singh, E mail: drudayss@gmail.com

Abstract :

   Introduction: According to the Global Burden of Disease Study 2015, the age group having the highest percentage of persons living with depression is the elderly, especially between the sixty to eighty year age group. Depression in later age is a very common psychiatric morbidity. A validated screening tool is very helpful to recognize depression in early stages. **Objectives:** To screen for depression among sixty to eighty year old people living in old age homes of Anand taluka and study variables that may be associated with it. **Method:** Inhabitants of old age homes between the age group sixty to eighty years in Anand taluka were included in the study. The participants were screened using the Geriatric Depression Scale-short version. For the associated variables, dichotomous responses were taken. The participants who were found depressed by the scale were referred for further counseling. **Results:** Two- third of the participants screened were found as depressed. Depression was more among females, participants with co-morbidities, participants who are living alone and those who were financially dependent. **Conclusion:** According to our study, females especially in the 60-69 year age group were found to be depressed more than the other age group and gender. It is important to look into other factors which may be associated with old age depression which need to be assessed for each elderly separately.

Key Words : Depression, Screening, Old age

Introduction :

Depression is the leading cause of ill health and disability worldwide. According to the latest estimates from WHO, more than 300 million people are now living with depression, an increase of more than 18% between 2005 and 2015.[1] As estimated by WHO, depression occurs in 7% of the general elderly population.[1]

The WHO has identified strong links between depression and other non-communicable disorders and diseases. Depression is also an important risk factor for suicide, which claims hundreds of thousands of lives each year. It is very important to screen for depression at a very early stage in order to prevent mortalities.

The theme for the 2017 World Health Day was depression. The campaign slogan being –"Depression: let's talk". This implies that there is a need for public awareness in this field. Many efforts are being done in order to make the general public aware of mental health.

India is home to an estimated 57 million people (18% of the global estimate) affected by depression.[3] A systematic review reported a prevalence of 21.9% for depression among the elderly in India. Among the community based studies in the elderly, the prevalence of depression ranged from 3.9% to 47.0% with higher rates among female and urban residents.[4]

Objectives:

To screen for depression among sixty to eighty year olds living in old age homes of Anand taluka and study variables that may be associated with it.

Method:

   Ethical clearance for the study was obtained from the Institutimal ethics Committee, PSMC, Karamsad. The permission to carry out the study was obtained

from the heads of old age homes. All individuals participated in the study voluntarily. Informed consent was obtained from all the participants.

The inclusion criteria was 60-80 year old inhabitants of old age homes in Anand taluka. The individuals who were already diagnosed and were on treatment for mental health problems, individuals who were non-cooperative or had severe behavioral problems or cognitive impairment; or had a severe hearing impairment; or known terminal illness were also excluded. 3 old age homes from Anand taluka were included in the study. Collectively in all these three old age homes, fitting to the criteria of inclusion and exclusion, a total of 50 participants were finally screened. The purpose of the study was explained and consent was taken from each participant. All the participants were screened using the Geriatric Depression Scale (GDS-short version).[5] The GDS-short version consists of a set of 15 questions to be answered in a 'yes' or 'no' format. Scoring of the scale was done according to the guidelines. A participant with a score of above 5 was considered depressed according to the GDS-short version. The participants who were found out to be depressed by screening were referred for further evaluation and counseling at the tertiary center.

Results:

Out of 50 participants, 33(66%) were found to have a score above 5 and hence classified as depressed which is shown in Figure 1.

Figure 1: Percentage of participants screened
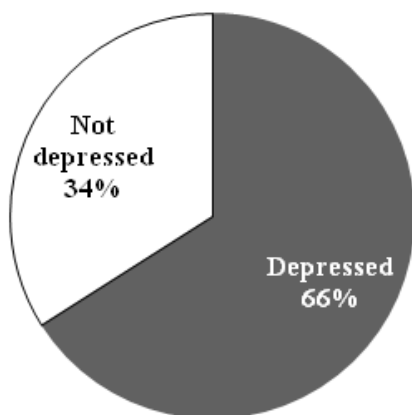
Based on gender, 10 out of the 17 males (59%) and 23 out of the 33 females (70%) were depressed. Based on age group, 12 out of 15(80%) in the age group of

60-69 years and 21 out of 35(60%) in the age group 70-80 years were depressed. 50% of males in 60-69 years age group were depressed as compared to 85% of females in the same age group.60% males were depressed and 60% females were depressed in the 70-80 years age group in our study. Figure 2 shows the prevalence of depression among participants according to age and gender.

Figure 2: Prevalence of depression among participants according to age and gender
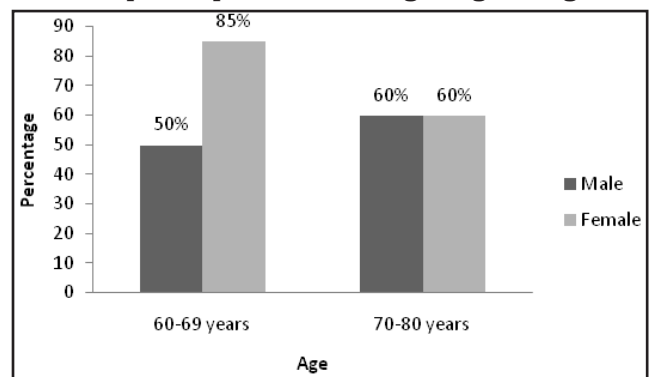
As shown in Table 1, 17 out of 22 (77%) participants who were suffering from Diabetes and/or Hypertension were depressed as opposed to 16 out of 28(57%) who were not suffering from these conditions. 23 out of 32 (72%) participants who were financially dependent were depressed whereas 10 out of 18 (55%) participants who were financially independent were depressed. 20 out of 31 (64%) participants whose spouse was alive were depressed compared to 13 out of 19 (68%) participants whose spouse was not alive. All these above associations were not found to be significant (p>0.05).

Discussion:

This study was conducted to screen sixty to eighty year olds living in old age homes of Anand taluka for depression. A study done in Rajkot, Gujarat by Zalavadia D et al found females to be more depressed as compared to males, a finding similar to our study(although found to be statistically not significant. They also found economic maladies and the presence of chronic ailments as predictors of depression, but both these variables were statistically not significant in current study. [6]

In another study done by Sinha S et al in Tamil Nadu, female sex and widowhood were found to be

Table 1: Presence of depression and association with various independent variables

Variables		Depression		Chi square (P value)
		Yes (%)	No (%)	
Gender	Male	10 (58.8)	7 (41.1)	0.591
	Female	23 (69.6)	10 (30.3)	(0.4419)
Co-morbidities	Present	17 (77.2)	5 (22.7)	2.225
	Absent	16 (57.1)	12 (42.8)	(0.1358)
Financial Independence	Present	10 (55.5)	8 (44.4)	1.367
	Absent	23 (71.8)	9 (28.1)	(0.2423)
Spouse status	Alive	20 (64.5)	11 (35.4)	0.080
	Not alive	13 (68.4)	6 (31.5)	(0.777)

significantly associated with depression. In the present study, there was no significant association between non living spouse and depression.[7]

A study done in Puducherry by Kavithai P et al found being female and widow/single significant factors for risk of depression in contrast to this study where these were found to not be significant.[8] Mohan U et al in their study conducted in Lucknow found out that depression among the elderly living in old age homes is more than the elderly who are living with the family. In contrast to the present study, they found that depression was more prevalent among the elderly who were not financially independent.[9]

A study done by Karthik C et al in old age homes in Bangalore using Geriatric depression scale found out that 63.73% of the elderly were having depressive syndrome which is consistent with the current study.[10] Chalise H et al in their study among elderly living in old age homes in Nepal found out that 57.8% of the elderly people living in old age homes were having depression. A similar finding was found in the current study.[11]

Conclusion and Recommendation:

According to this study, females especially in the 60-69 year age group were found to be depressed more than the other age group and gender. Although we studied some independent variables, they were not found to have significant association.

Certain problems in this age group may be subjecting, therefore qualitative studies should be carried out to understand the depth of the problem and to ascertain reasons for their depressed state. It is important to look into other factors which may be associated with old age depression which need to be assessed for each elderly separately. Therefore, it is imperative to have a holistic approach to health for the elderly. Associated socio-economic variables need to be addressed in order for them to have a better quality of life.

Declaration:

Funding: Nil

Conflict of Interest: Nil

References:

1. world health organization. andquot;Depression: let's talkandquot; says WHO, as depression tops list of causes of ill health [Internet]. 2017 [cited 2019 Jan 21]. Available from: https://www.who.int/news-room/detail/30-03-2017--depression-let-s-talk-says-who-as-depression-tops-list-of-causes-of-ill-health

2. world health organization. Mental health of older adults [Internet]. 2017 [cited 2019 Jan 21]. Available from: https://www.who.int/news-room/fact-sheets/detail/mental-health-of-older-adults

3. Depression [Internet]. 2017 [cited 2019 Jan 21]. Available from: http://www.searo.who.int/india/depression_in_india.pdf

4. Barua A, Ghosh M, Kar N, Basilio M. Prevalence of depressive disorders in the elderly. Ann Saudi Med. 2011;31(6):620–4.

5. Marc LG, Raue PJ, Bruce ML. Screening Performance of the 15-Item Geriatric Depression Scale in a Diverse Elderly Home Care Population. Am J Geriatr Psychiatry [Internet]. 2008 Nov [cited 2019 Jan 22];16(11):914–21. Available from: http://www.ncbi.nlm.nih.gov/pubmed/18978252

6. Zalavadiya DD, Banerjee A, Sheth AM, Rangoonwala M, Mitra A, Kadri AM. A Comparative Study of Depression and Associated Risk Factors among Elderly Inmates of Old Age Homes and Community of Rajkot: A Gujarati Version of the Geriatric Depression Scale-Short Form (GDS-G). Indian J Community Med [Internet]. 2017 [cited 2019 Jan 22];42(4):204–8. Available from: http://www.ncbi.nlm.nih.gov/pubmed/29184319

7. Sinha SP, Shrivastava SR, Ramasamy J. Depression in an older adult rural population in India. MEDICC Rev [Internet]. 2013 Oct [cited 2019 Jan 22];15(4):41–4. Available from: http://www.ncbi.nlm.nih.gov/pubmed/24253350

8. Kavithai P, R. A, S. B, M. P. A cross sectional study on screening for depression among elderly in rural areas of Puducherry, India. Int J Res Med Sci. 2018;7(1):46.

9. Mohan U, Gupta A, Singh S, Tiwari S, Singh V. Study of Depression in Geriatric Population: Old Age Home and Community in Lucknow India. Int J Epidemiol [Internet]. 2015 Oct 1 [cited 2019 Jan 22];44(suppl_1):i97–i97. Available from: https://academic.oup.com/ije/article/2573052/Study

10. C. K, G. V, Shobha S, S. R, P. S. A study to estimate the prevalence of depression among the inmates of select old age homes in Bangalore city, India. Int J Community Med Public Heal [Internet]. 2016 Dec 28 [cited 2019 Jan 22];3(7):1803–6. Available from: http://ijcmph.com/index.php/ijcmph/article/view/302

11. Chalise HN. Depression among elderly living in Briddashram (old age home). Adv Aging Res [Internet]. 2014 Feb 6 [cited 2019 Jan 22];03(01):6–11. Available from: http://www.scirp.org/journal/doi.aspx?DOI=10.4236/aar.2014.31002

KAP Study on Swacch Bharat Programme among Urban Slum Dwellers in Nandyal, Andhra Pradesh

M.A.Mushtaq Pasha[1], D.K.Veeresappa[2], Afsar Fatima[3], B.S.Isaac Ebenezer[3]

[1] Professor and HOD, [2] Assistant professor and Statistician, [3] Professor, Department of Community Medicine, Santhiram Medical College, Nandyal, Andhra Pradesh, India

Correspondence : Dr. M. A. Mushtaq Pasha, Email: mampasha@gmail.com

Abstract :

Introduction: Prime Minister had launched Swacch Bharat Mission on October 2,2014.Swachh Bharat Abhiyan (SBA) (or Swachh Bharat Mission (SBM) or Clean India Mission in English) is a campaign that aims to clean up the streets, roads and infrastructure of India's cities, smaller towns, and rural areas. **Methods:** The aim of this study was to assess the level of knowledge, perception and practices related to cleanliness, sanitation, health and hygiene among urban slum dwellers. The study is a cross-sectional study. A total of 493 slum dwellers were interviewed. **Results:** Out of 493 slum dwellers,86.2% had toilet facility at home and 83% of them disposed solid waste in public dustbin,14.2% disposed solidwaste in backyard and 2.8% disposed solid waste on to the road. **Conclusions:** 75.3% found that Swacch Bharat is necessary for improving the environment.

Key Words : Cleanliness, Swacch Bharat Mission, Toilet facility, Urban slum dwellers

Introduction :

Prime Minister launched Swachh Bharat Abhiyan (SBA) (or Swachh Bharat Mission (SBM) or Clean India Mission in English) on October 2, 2014 at Rajghat , New Delhi. Prime Minister announced that clean India would be the best tribute India could pay to Mahatma Gandhi[1] while celebrating his 150th birth anniversary in 2019. SBA is a campaign in India that aims to clean the streets, roads and infrastructure of India's cities, smaller towns, and rural areas. The objectives of Swachh Bharat include eliminating open defecation, construction of household-owned and community-owned toilets ,the mission aims to achieve an Open-Defecation Free (ODF) India by 2 October 2019, the 150th anniversary of the birth of Mahatma Gandhi, by constructing 12 million toilets in rural India at a projected cost of ₹1.96 lakh crore (US$30 billion).[2]

Under the Corporate Social Responsibility (CSR) Plans, PSUs under Power, Coal and Renewable Energy Ministries are to build 50,000 toilets in schools by August 2015.[3] It is India's largest ever cleanliness drive with 3 million government employees, school students, and college students from all parts of India participating in 4,041 statutory cities, towns and associated rural areas.The mission contains two sub-missions: Swachh Bharat Abhiyan ("Gramin or rural"), which operates under the "Ministry of Drinking Water and Sanitation"; and Swachh Bharat Abhiyan ("Urban"), which operates under the "Ministry of Housing and Urban Affairs."[4]

Method:

The present study is a cross-sectional study, from July 1st 2017 to October 31st 2017. A sample of 493 slum dwellersofthe urban slums of Nandyal were taken by convenience sampling method and interviewed with semi-structured pre-tested questionnaire. Consent was taken from the subjects after explaining the purpose of the study. Prior consent was taken from the Institutional ethical committee.

Inclusion criteria: The subjects aged above 18 years, who were available and willing to participate in the study, were included.

Exclusion criteria: The subjects who were not available inspite of 3 consecutive visits at the time of data collection were excluded from the study.

Statistical analysis was done using Predictive Analytics Software (SPSS 22 version).

Results:

Table 1: Socio-demographic profile of urban slum dwellers

AGE (Years)	NUMBER (%)
18 28	208 (42.1%)
39 - 58	252 (51.1%)
59 78	33 (6.6%)
SEX	**NUMBER (%)**
Males	171 (34.7%)
Females	322 (65.3%)
EDUCATION	**NUMBER (%)**
Illiterate	124 (25.2%)
Primary school	76 (15.4%)
High school	112 (22.7%)
Intermediate	72 (14.6%)
Degree	92 (18.7%)
PG	12 (2.4%)
Professional	5 (1.0%)
OCCUPATION	**NUMBER (%)**
Unemployed	258 (52.3%)
Unskilled	66 (13.4%)
Semi-skilled	58 (11.8%)
Skilled	43 (8.7%)
Semi-profession	55 (11.1%)
Profession	13 (2.6%)
CASTE	**NUMBER (%)**
OC (Open Category)	149 (30.2%)
BC (Backward Caste)	242 (49.1%)
SC (Scheduled Caste)	89 (18.1%)
ST (Scheduled Tribe)	13 (2.6%)

In the present study, majority belonged to 39-58yrs 65.3% were females, 25.2% were illiterates, 52.3% were unemployed, 49.1% belonged to Backward caste.(Table 1)

80.7% of the slum dwellers were aware about SBA, 75.3% felt that SBA is necessary for improving the environment. Only 18.2% of them participated in community sanitation. Only 29.4% of them maintained good sanitation in toilets at home. 90.1% of the slum dwellers did not witness any awareness camps of SBA. Only 39.8% of them know the principles of SBA.19.3% of slum dwellers don't have proper drainage system.43.2% of the slum dwellers did not find any change after the implementation of SBA. (Table 2)

Illiterates (38.7%) were less aware of Swacch Bharat Mission. (Table 3)

Slum dwellers who were post graduates and degree holders cleaned their house daily. (Table 4)

91.7% of the slum dwellers who were post graduates participated in community sanitation. (Table 5)

Discussion:

In a study in Jharkhand state, 68% of the respondents were found of the view that the activities of Swacch Bharat Mission carried out at village level had improved the environment. In the present study 75.3% of urban slum dwellers found that Swacch Bharath Abhiyan is necessary for improving the environment.[5]

In a study in Jharkhand, more than 90% of the respondents found habitual in keeping houses clean and the community places as well.[5] Out of the total respondents 54.49% were found habitual in using toilet and also cleaning the same periodically, whereas the present study showed 91.3% of slum dwellers cleaned their house daily and only29.4% of slum dwellers maintained good sanitation in their toilets.

In Jharkhand study Household of 27.25% of the respondents used to throw solid waste on the roadside (20.29%), but the present study showed that 83% dispose solid waste in to public dustbin, 14.2% disposed solid waste to backyard, 2.8% disposed solid waste on to the road.[5]

In the present study only 14.8% participated in community sanitation camps, while in Jharkhand 70.4% did not participate, 3.4% participated occasionally, 11.4%don't have any idea about Swasthya melas.[5]

Table 2 : Knowledge and Attitude regarding Swacch Bharat Mission among urban slum dwellers of Nandyal

Knowledge and Attitude Regarding Swacch Bharat Mission	YES	NO	TOTAL
Awareness of SBA	398(80.7%)	95(19.3%)	493(100%)
SBA is necessary for improving the environment	371(75.3%)	122 (24.7%)	493(100%)
Participate in community sanitation	90(18.2%)	403(81.8%)	493(100%)
Maintain good sanitation in toilets at home	145(29.4%)	348(70.6%)	493(100%)
Witness any awareness camps of SBA	49(9.9%)	444(90.1%)	493(100%)
Know the principles of SBA	196(39.8%)	297(60.2%)	493(100%)
Proper Drainage system present	398(80.7%)	95(19.3%)	493(100%)
Any change after implementation of SBA	280(56.8%)	213(43.2%)	493(100%)

Figure 1: Distribution of Slum Dwellers according to house cleaning daily.
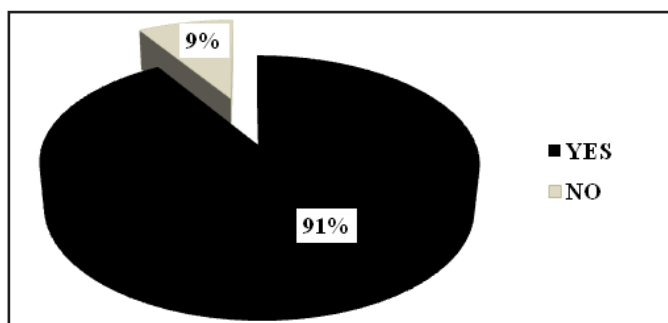

Figure 2: Distribution of Slum Dwellers according to place of solid waste disposal.
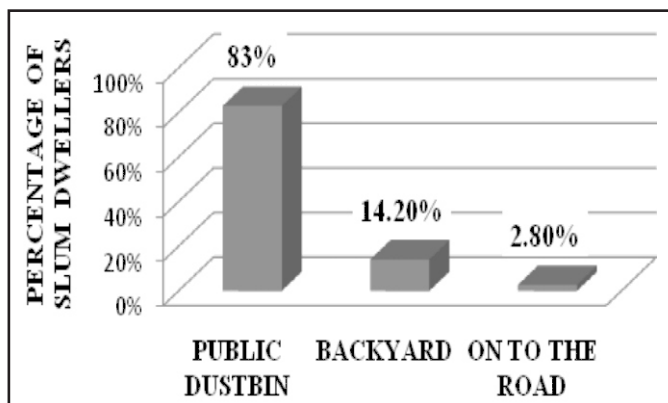

Figure 3: Distribution of Slum Dwellers according to frequency of drainage cleaning.
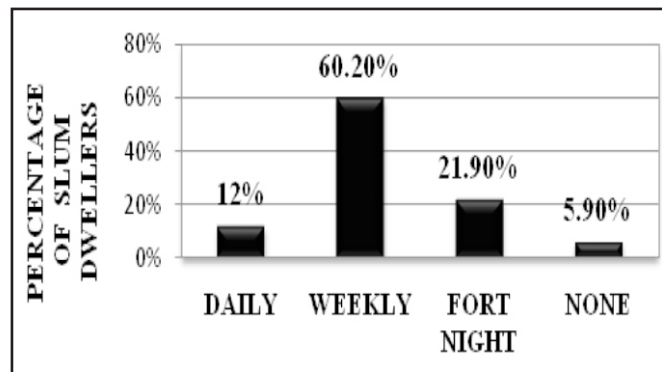

Figure 4: Distribution of Slum Dwellers according to place of toilet facility.
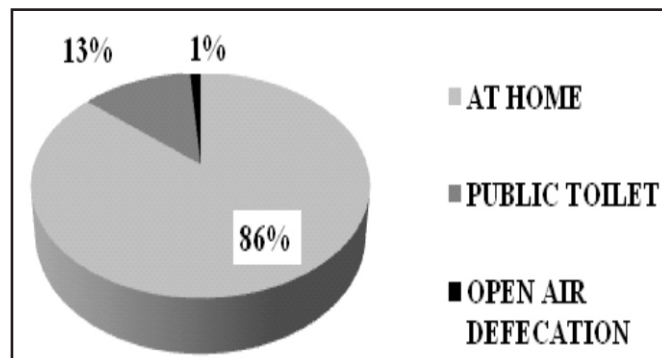
Table 3: Education Vs Awareness of SBA

Education	Awareness of SBA		Total	p - value
	Yes	**No**		
Illiterate	76(61.3%)	48 (38.7%)	124(100%)	0.001
Primary	48(63.2%)	28(36.9%)	76 (100%)	
High School	102(91.1%)	10(9%)	112(100%)	
Inter	68(94.4%)	4(5.6%)	72(100%)	
Degree	87(94.6%)	5(5.5%)	92(100%)	
Post Graduate	11(91.6%)	1(8.4%)	12(100%)	
Professional	4(80%)	1(20%)	5(100%)	
Total	398(80.7%)	95(19.3%)	493(100%)	

Chi-Square=72.64, P-value < 0.05, which is highly significant

Table 4: Education Vs Cleaning of House daily

Education	Daily House cleaning		Total	p - value
	Yes	**No**		
Illiterate	109 (87.9%)	15 (12.1%)	124 (100%)	
Primary School	65 (85.5%)	**11 (14.5%)**	76(100%)	
High School	105 (93.8%)	7 (6.3%)	112(100%)	
Inter	64 (88.9%)	8 (11.1%)	72(100%)	
Degree	90 (97.8%)	2 (2.2%)	92(100%)	0.04
Post Graduate	**12 (100%)**	0(0%)	12(100%)	
Professional	**5(100%)**	0(0%)	5(100%)	
Total	450 (91.3%)	43(8.7%)	493(100%)	

Chi-Square = 12.88 , P - value < 0.05, which is highly significant

86.2% of households had toilet facility at home, 12.6% use public toilet and 1.2% go for open air defecation in the present study, whereas in the study in Jharkhand, 61.46% of the respondents have toilet in their house, 38.55% don't have toilet in their house.[5,7]

Conclusions:

Majority (75.3%) of the slum dwellers felt that Swacch Bharat Abhiyan is necessary for improving the

Table 5: Education Vs Participation in community sanitation

Education	Participation in community sanitation		Total	p - value
	Yes	**No**		
Illiterate	31(25%)	93(75%)	124(100%)	
Primary	19(25%)	57(75%)	76(100%)	
High School	15(13.4%)	97(86.6%)	112(100%)	
Inter	14(19.5%)	58(80.5%)	72(100%)	0.01
Degree	8 (8.7%)	84(91.3%)	92(100%)	
Post Graduate	1(8.3%)	11(91.7%)	12(100%)	
Professional	2(40%)	3 (60%)	5(100%)	
Total	90(18.2%)	403(81.8%)	493(100%)	

Chi-Square =15.94, P- value < 0.05, which is highly significant

environment Cleaning of house daily (91.3%) increased after the implementation of programme but maintenance of good sanitation in the toilet (only 29.4%) was not improved. Inspite of the awareness camps and community sanitation programmes held the slum dwellers were still disposing solid waste into backyard (14.20%) and on to the road (2.80%).

Recommendations:

Periodic IEC activities regarding Swacch Bharat Mission by people of different spheres (high school students, medical students, engineering students, teachers, local leaders etc.) should be conducted. Building community toilets by CSR (Corporate Social Responsibility) is required.[6] Using teaching aids about activities of Swacch Bharat Mission(toilet facility, house cleaning, proper drainage, proper disposal of solid waste) will be of help. Self-participation of the people involved in IEC activities along with local people in cleaning activities of Swacch Bharat Mission should be ensured. Short-term refresher training programmes should be provided at regular intervals so that the people learn more about health, hygiene and sanitation. Mechanism to evaluate the progress of the programme periodically in the slums should be developed. Measures to eliminate manual scavenging is must.

Declaration:

Funding: Nil

Conflict of Interest: Nil

References:

1. Bombay Sarvodaya Mandal and Gandhi Research Foundation, Importance of Gandhian thoughts about Cleanliness by Dr. Shubhangi Rathi.https://www.mkgandhi.org/ articles/ gandhian-thoughts-about-cleanliness.html Last accessed 05/09/2019.

2. Swacch Bharat Mission. http://www.thehindu.com/ news/ national/swacch-bharat-mission/article6552179.ece#!! Last accessed 05/09/2019.

3. Kurtkoti A. Swachh Bharat Abhiyan – Leading to Healthier Life and Prosperity." Case Study, Corporate Social Responsibility http://www.etcases.com/swachh-bharat-abhiyan-leading-to-healthier-life-and-prosperity.html Last accessed 05/09/2019

4. Swachh Bharat mission https://en.wikipedia.org/wiki/ Swachh_Bharat_Abhiyan. Last accessed 05/09/2019

5. Impact Assessment of Swacch Bharat Abhiyan Project Implemented by Aarogya Foundation India in Blocks of Jharkhand State (https://www.ekal.org/pdf/swachh-bharat-abhiyan-project.pdf) Last accessed 05/09/2019

6. Corporate Social Responsibility and Sanitation. http://ficci.in/spdocument/20748/Publication-Sanitation.pdf Last accessed 05/09/2019

7. Case study of Urban Slum Dwellers of Kalyani, West Bengal: http://www.cltsfoundation.org/can-urban-slum-dwellers-swachh-bharat-mission-kalyani-bengal-right-sanitation-land-tenure/ Last accessed 05/09/2019

Pregnancy Outcomes among High-Risk Mothers Attending Primary Health Centres of Bhavnagar District, Gujarat

Pooja A Chauhan[1], K. D. Bhalani[2]

[1] Resident Doctor, [2]Associate Professor, Department of Community Medicine, Government Medical College, Bhavnagar, Gujarat, India

Correspondence : Dr. K. D. Bhalani, Email: kdbhalani@gmail.com

Abstract :

   Introduction: All pregnancies and deliveries are potentially at risk. However, there are certain categories of pregnancies where the mother, the foetus or the neonate is in a state of increased jeopardy. Some pregnancies become high-risk as they progress, while some women are at increased risk for complications even before they get pregnant for a variety of reasons. Objectives: To assess the outcome of the pregnancy of the high-risk mothers. **Method:** It was a cross-sectional study conducted among the high-risk mothers of Bhavnagar district during the period from March 2017 to August 2018. 10 PHCs (5 worst+ 5 best performing PHCs) were selected using PHC score card. From each selected PHCs, 3 sub centres were selected randomly. From each selected sub centre, 3 high-risk mothers were randomly selected and interviewed. **Results:** From the worst performing PHCs, 28.9% of the mothers and from the best performing PHCs, 40% of the mothers had caesarean delivery(CS). 6.7% of the mothers from the each group of PHCs delivered preterm babies. Low birth weight babies were delivered to 46.7% of the mothers from the worst performing PHCs as against 22.2% of the mothers from the best performing PHCs. Still birth rate(SBR) in the mothers of worst and best performing PHCs was found 22.2 and 44.4 respectively. And neonatal mortality rate(NMR) in the mothers of the best performing PHCs was found 46.5. **Conclusion:** SBR, NMR and proportion of CS delivery were higher among the mothers of best performing PHCs as compare to worst performing PHCs (P>0.05).

Key Words : High-Risk, Outcome, Pregnancy, Risk Factors

Introduction :

A high-risk pregnancy is broadly defined as one in which the mother, foetus, or newborn is, or may possibly be, at increased risk of morbidity or mortality before, during, or after delivery. [1] Of all pregnancies, about 20-30% of pregnancies belong to high-risk category. Even with adequate antenatal and intranatal care, this small group is responsible for 70–80% of perinatal mortality and morbidity. [2]

Perinatal outcome can be changed significantly by early detection followed by special intensive care of high-risk pregnancies. Research has shown that small and affordable measures can significantly reduce the health risks that women facewhen they become pregnant. Most maternal morbidity and mortality could be prevented if women had access to appropriate and timely health care during pregnancy, childbirth and immediately afterwards.

It isessential to give special attention for high risk groupwhich will reduce perinatal and maternal mortality and morbidity. Thus, it is need to study outcome in high -risk pregnancy which will be helpful forfuture health planning to avoid poor outcome and to improve the management of high-risk pregnancy. The present study was intended to assess the outcome of high-risk pregnancy among the high-risk mothers.

Objectives:

1. To assess the maternal and foetal outcome of high-risk pregnancy among the high-risk mothers.

2. To find out the association between mothers' addiction and birth weight of babies.

3. To find out the association between ANC visits and birth weight of babies.

Method:

It was a cross-sectional study conducted in 5 worst performing and 5 best performing PHCs of Bhavnagar district during the period between March 2017 to August 2018.The study sample consisted of 90 high-risk mothers (45 high-risk mothers each from the worst and the best performing PHCs). The high-risk mothers, who were not willing to participate in the study were excluded from the study.

Permission was obtained from Chief District Health Officer of Bhavnagar district and in the first stage, 5 best performing and 5 worst performing PHCs were selected by using total composite index calculated from PHC score card. Total composite index includes different indices like pregnancy care group index (which includes early pregnancy registration, no. of ANC visit, 100 tablets of IFA, Inj. TT), child birth group index (status of birth, institutional delivery), reproductive age group index, post natal mother and newborn care group index. All the indices were given equal weightage to formulate total composite index.

The lowest total composite index among the selected best performing PHCs was 0.82 and the highest total composite index among the selected worst performing PHCs was 0.24.

In the second stage, from each selected PHC, 3 sub-centers and finally 3 high-risk mothers from each selected sub-center were selected by simple random sampling using lottery method. If 3 high-risk mothers were not available in that sub-centre, another sub-centre was selected by using lottery method.

A semi-structured questionnaire was designed, which was corrected by conducting a pilot study among 10 high-risk mothers from the nearby PHC.

All the selected high-risk mothers defined according to the government guideline by Female Health Worker and Medical Officer were interviewed in a local language, at a place and time convenient to the participant. All the mothers were interviewed 42 days to 75 days after the delivery and information regarding place of delivery, term of delivery, mode of delivery, birth outcome, birth weight, addiction of mothers, number of ANC visits etc. was collected.

Informed written consent was obtained from all the participating mothers after explaining the nature and purpose of the study in the local language. Privacy was ensured while taking the interview. Ethical approval was obtained from the IRB, Government Medical College, Bhavnagar for conducting this study.

A face validation of the questionnaire was done. The study procedures from recruitment till data entry were piloted for feasibility and for making any changes in the procedures. The 2nd version of the questionnaire was used for the study. Data entry was done in Epi Info software version 7.0 with appropriate data checks in order to avoid errors in data entry. The study findings can be generalized to the high-risk mothers registered in the PHCs of the Bhavnagar district of Gujarat as the sample was selected from the population of high-risk mothers registered in the PHCs of Bhavnagar district.

Results:

This study assessed the maternal and foetal outcome of high-risk pregnancy among the high-risk mothers of Bhavnagar district, Gujarat.

As observed from the table 1, in the worst performing PHCs, 80% of high-risk mothers were between the age group of 25-35 years, while in the best performing PHCs, 68.9% of the high-risk mothers were between the age group of 25-35 years.

Almost all the selected mothers were Hindus in both types of PHCs. In the worst performing PHCs, 37.7% of the high-risk mothers were illiterate, while in the best performing PHCs, 28.8% of the high-risk mothers were illiterate. According to the Modified Prasad classification, among the high-risk mothers, in the worst performing PHCs, 46.7% of the mothers were from the lower middle class and 26.7% of the mothers were from the middle class, while in the best performing PHCs, 53.3% of the mothers were from the lower middle class and 24.5% mothers were from the lower class.

As observed from the table 2, 6.7% of the mothers from the each group of PHCs delivered preterm babies.

From the worst performing PHCs, 28.9% of the mothers and from the best performing PHCs, 40.0% of the mothers were delivered by caesarean section. The proportion of caesarean delivery found to be higher in

Table 1: Socio-Demographic Profile of the Selected High-risk Mothers of Bhavnagar District

Socio demographic factors	Groups	Number of the high-risk mothers (%)	
		Worst performing PHCs (n=45)	Best performing PHCs (n=45)
Age (In completed years)	<25 years	8 (17.8)	12 (26.7)
	25-35 years	36 (80.0)	31 (68.9)
	>35 years	1 (2.2)	2 (4.4)
Religion	Hindu	43 (95.6)	45 (100)
	Muslim	2 (4.4)	0
Caste	SC	2 (4.4)	5 (11.1)
	OBC	38 (84.5)	33(73.3)
	General	5 (11.1)	7 (15.6)
Education	⩾High school	3 (6.7)	3 (6.7)
	Middle school	4 (8.9)	8 (17.8)
	Primary school	21 (46.7)	21 (46.7)
	Illiterate	17 (37.7)	13(28.8)
Occupation	Housewife	32 (71.1)	40 (88.9)
	Labour	4 (8.9)	1 (2.2)
	Agriculture	9 (20.0)	4 (8.9)
Modified Prasad Socio-economic class	Upper middle class II	6 (13.3)	2 (4.4)
	Middle class III	12 (26.7)	8 (17.8)
	Lower middle class IV	21 (46.7)	24 (53.3)
	Lower class V	6 (13.3)	11 (24.5)

the best performing PHCs than the other group.

In the present study, 2.2% of the mothers from the worst performing PHCs and 4.4% of the mothers from the best performing PHCs had still birth. Low birth weight babies were delivered to 46.7% of the mothers from the worst performing PHCs as against 22.2% of the mothers from the best performing PHCs. The difference observed was found statistically significant. (P=0.015)

As observed from the table 3, all of the high-risk mothers from both the groups of the PHCs were found alive after 42 days of delivery. In the worst and best performing PHCs, 2.2% and 4.4% of the delivery resulted in still birth respectively. In the best performing PHCs, 4.4% of the babies delivered to the high risk mothers died during their neonatal period, however none of the babies were died from the worst performing PHCs during the period. So in this study, neonatal mortality rate of the infants delivered to high-risk mothers from the best performing PHCs was 46.5/1000 live births.

It was found in the study that in the worst performing PHCs, 33.3% of the mothers with tobacco addiction delivered LBW babies. In the best performing PHCs, 14.3% of the addicted mothers delivered LBW babies. It was also found that in the

Table 2: Distribution of the High-risk Mothers for Various Intranatal Parameters in Worst and Best Performing PHCs

Various parameters	Worst performing PHCs n=45 (%)	Best performing PHCs n=45 (%)	Chi - square	P-value	OR (95% CI)
Term of delivery					
Preterm	3 (6.7)	3 (6.7)	0.000	1.000	1.000
Term	42 (93.3)	42 (93.3)	df=1		(0.191-5.241)
Mode of delivery					
Normal	32 (71.1)	27 (60.0)	1.230	0.267	1.641
Caesarean	13 (28.9)	18 (40.0)	df=1		(0.682-3.949)
Birth outcome					
Live birth	44 (97.8)	43 (95.6)	0.557	0.557	2.047
Still birth	1 (2.2)	2 (4.4)	df=1		(0.179-23.409)
Birth weight					
<2.5kg	21 (46.7)	10 (22.2)	0.015	0.015	3.063
>2.5 kg	24 (53.3)	35 (77.8)	df=1		(1.227 7.645)

Table 3: Status of the High-risk Mothers and Infants after 42 days of delivery

	Number of deaths (%)	
	Worst performing PHCs (n=45)	Best performing PHCs (n=45)
Mothers	0	0
Still Birth	1 (2.2)	2 (4.4)
Neonatal Death	0	2 (4.4)

worst performing PHCs, 38.1% of the mothers with less than 4 ANC visits delivered LBW babies. In the best performing PHCs, 16.7% of the mothers with less than 4 ANC visits delivered LBW babies.

Discussion:

In the present study, 6.7% of the high-risk mothers from the each group of PHCs delivered preterm babies. H. Akthar et al (2009) in their study in Bangladesh found that 17.69% of the high-risk mothers delivered preterm babies[3], which was higher than the present study.

In the present study, 28.9% and 53.3% of the high-

risk mothers from worst and best performing PHCs respectively delivered in government facility. Out of the 5 selected worst performing PHCs, delivery services was not provided at 1 of the PHCs, which may be the reason for less number of deliveries in the government institutions in the worst performing PHCs compare to the best performing PHCs. Significant number of deliveries in the study group, which consisted of high risk mothers were not getting delivered in government institutions, which might be because of people's perception that the private institution provides better quality care. According to the NFHS-4, in India, 52.1% of the institutional delivery were conducted in the public facility.[4] A. Jadho et al (2017) in their study in rural area of Nagpur district found that 1.39% of the high-risk mothers had home delivery and 98.61% of the high-risk mothers had institutional delivery.[5]

In the present study, 28.9% and 40.0% of the high-risk mothers from worst and best performing PHCs respectively delivered by caesarean section, which was found lower than the other study conducted among high-risk mothers of different geographic areas. According to the NFHS-4, in India, caesarean section rate was 17.2% among all the pregnant women.[4] A. Jadho et al (2017) in their study in rural area of Nagpur district found that 68.0% of the high-risk mothers had caesarean delivery.[5] E. Kashani et al (2012) in their study in Iran found that 58.1% of the high-risk mothers had caesarean delivery.[6] H. Akthar et al (2009) in their study in Bangladesh found that 70.8% of the high-risk mothers had caesarean delivery.[3] V. Kolluru (2016) in their hospital based study in Telagana found that 82.5% of the high risk mothers had operative intervention either caesarean section or instrumental vaginal delivery.[7]

In the present study, 2.2% and 4.4% of the high-risk mothers from worst and best performing PHCs respectively had still birth. A. Jadho et al (2017) in their study in rural area of Nagpur district found that 1.39% of the high-risk mothers had still birth[5], which was lower than then the present study. H. Akthar et al (2009) in their study in Bangladesh found that 3.53% of the high-risk mothers had still birth.[3]

In the present study, to 46.7% and 22.2% of the high-risk mothers from the worst and best performing PHCs respectively delivered low birth

babies. A. Jadho et al (2017) in their study in rural area of Nagpur district found that 20.83% of the high-risk mothers delivered LBW babies.[5] V. Kolluru (2016) in their hospital based study in Telagana found that 20.0% of the high-risk mother had LBW babies.[7] E. Kashani et al (2012) in their study in Iran found that 21.3% of the high-risk mothers had preterm or LBW babies.[6] H. Akthar et al (2009) in their study in Bangladesh found that 6.6% of the high-risk mothers had LBW babies.[3]

Socio-demographic variables and place of delivery: In the present study, it was observed that in the best performing PHCs as the level of education increased, the proportion of delivery in the government hospital increased. But the association was not found statistically significant. (P=0.623) There was no specific trend or association found between socio-economic class and place of delivery in any of the group of PHCs.

J. Sahoo et al (2015) in their study among pregnant mothers in rural field practice area of Maulana Azad Medical Collge, New Delhi found significant association of proportion of institutional delivery with higher education and also with more wealth.[8]

Socio-demographic variables and mode of delivery: In the worst performing PHCs, proportion of caesarean delivery was found higher in the mothers who were studied more than middle class compare to the mothers studied less than middle class. In the best performing PHCs, the proportion of caesarean delivery was found higher in mothers who studied till middle class as compare to other categories.

The proportion of caesarean delivery was higher in socio-economic class II and III compare to class V and VI in both the groups of the PHCs. The associations of the level of education and socio-economic class of the high-risk mothers with mode of delivery were not found statistically significant.

M. Khan et al (2017) in their study based on Bangladesh Demographic and Health Survey conducted between 2004 and 2014, found increased rate of caesarean delivery with higher level of formal education and also with higher socio-economic status.[9]

Socio-demographic variables and birth weight: From the worst performing PHCs, all the mothers,

aged less than 25 years delivered LBW babies. The association found between the age of the mother and delivery of the LBW babies was found statistically significant.(P=0.002) The associations of the other socio-demographic variables i.e. education, occupation and socio-economic class with the delivery of LBW babies were also not found statistically significant in the mothers of any of the groups of the PHCs.

N. Gogoi (2017) in their study among the pregnant mothers in Guwahati found higher risk of delivery of LBW babies with lower level of education, with lower socio-economic status and among employed mothers.[10]

Addiction of the mother and birth weight:In the worst performing PHCs, 33.3% of the mothers with tobacco addiction had delivered LBW babies. In the best performing PHCs, 14.3% of the addicted mothers had delivered LBW babies. The association between the presence of tobacco addiction and birth weight of the infants among the high-risk mothers was not found statistically significant in any of the group of the PHCs. (P=0.3700 and P=0.5825 respectively)

R. Agrawal et al (2009) in their study among pregnant mothers in Varansi found significant negative correlation between birth weight and maternal addiction.[11]

Antenatal care visits and birth weight: In the worst performing PHCs, 38.1% of the mothers with less than 4 ANC visits had delivered LBW babies. In the best performing PHCs, 16.7% of the mothers with less than 4 ANC visits had delivered LBW babies. The association of the frequencies of ANC visits and delivery of the LBW babies among the high-risk mothers was not found statistically significant in any of the group of the PHCs. (P=0.539 and P=0.637)

Conclusion:

From the worst performing PHCs, 28.9% of the mothers and from the best performing PHCs, 40% of the mothers had caesarean delivery. 6.7% of the mothers from the each group of PHCs delivered preterm babies. Low birth weight babies were delivered to 46.7% of the mothers from the worst performing PHCs as against 22.2% of the mothers from the best performing PHCs.

Declaration:

Funding: Nil

Conflict of interest: Nil

References:

1. Decherney AH, Nathan L, Laufer N, Roman AS. Lange - Current Diagnosis andamp; Treatment - Obstetric andamp; Gynecology 11th edition. 2013.

2. DC Dutta's. Textbook of obstetrics. eighth. Jaypee Brothers Medical Publishers (P) Ltd Headquarters; 2015.

3. Akthar H, Sultana S, Siddique A. Neonatal Out Come in High Risk Pregnancy. J Teach Assoc. 2009;22(1):26–9.

4. International Institute for Sciences. India Fact Sheet. Natl Fam Heal Surv - 4 2015-16. 2016;1–6.

5. Jadho A, Gawade M, Ughade S. Outcome of pregnancy among high risk pregnancies in rural area of Nagpur, Central India. Int J Community Med Public Heal. 2017;4(3):628.

6. Kashani E, Hassanzad A, Ameri MA. The rate of the prevalence of high-risk pregnancies and the results on pregnant mothers and the effect on parameters after the birth. Adv Environ Biol. 2012;6(3):1319–24.

7. Kolluru V, Reddy A. Study of high risk scoring in pregnancy and perinatal outcome. Indian J Obstet Gynecol Res. 2016;3(4):407–9.

8. Sahoo J, Singh SV, Gupta VK, Garg S, Kishore J. Do socio-demographic factors still predict the choice of place of delivery: A cross-sectional study in rural North India. J Epidemiol Glob Health. Elsevier;5(4):S27–34.

9. Khan MN, Islam MM, Shariff AA, Alam MM, Rahman MM. Socio-demographic predictors and average annual rates of caesarean section in Bangladesh between 2004 and 2014. PLoS One. Public Library of Science; 2017;12(5).

10. Gogoi N. Socio-Demographic Determinants of Low Birth Weight in Northeastern City, India. Int J Integr Med Sci. 2018;5(3):587–91.

11. Agrawal R, Singh A. The relationship between neonates Low Birth Weight (LBW) and maternal parity and addiction in Varanasi, India. 2009;4(1):183–5.

Resumption of Activities of Daily Living (ADL): A Comparative Study between Normal and Caesarean Delivery

Sheetal Vyas[1], Jinkal Ajara[2], Megha Baria[2], Priyanka Bhagat[2], Arpana Chaudhary[2], Twinkle Chaudhary[2]

[1]Professor and Head, Department of community medicine, [2]Undergraduate MBBS students

AMC MET Medical college, Maninagar, Ahmedabad, Gujarat, India

Correspondence : Dr. Sheetal Vyas, E mail:dr_shvyas@yahoo.com

Abstract :

   Introduction: One of the main goals of every medical team, dealing with childbirth is performing a safe delivery. Resumption of ADL like sleeping, grooming, toileting, cooking, eating, watching TV and many other seated activities are earlier in normal delivery as compared to caesarean delivery. The present study intended study the proportion of different modes of delivery and to measure the time required for resumption of ADL by women after delivery. **Method:** A cross sectional study was carried out amongst 250 women who had delivered within last one year and attended paediatric OPD, wards and post-partum unit of a tertiary care teaching institute of Ahmedabad city as selected by simple random sampling technique. Predesigned and pretested proforma was used to note responses of women by personal interview by investigators. Information about mode of delivery and time taken for resumption of eight defined ADL during the last delivery was obtained from respondents. **Results:** Mean age of study population was 25.03±3.88 years. Mean Gravida was 2.26±1.2. Mean parity was 2.18±1.16. Mean of abortion was 0.18±0.49. Majority had delivered within last one month in a tertiary care institute. 69.2% had normal delivery and 30.8% had caesarean delivery. Assessment of time taken for resumption of eight ADL was carried out and a comparison was made. There was no significant difference between normal delivery with or without episiotomy except for the seated activities which took significantly longer time in deliveries with episiotomy. Resumption of all activities was significantly late in caesarean deliveries except for watching TV where there was no statistically significant difference. **Conclusions:** All the ADL are resumed late in caesarean deliveries as compared to normal delivery with or without episiotomy. The proportion of caesarean delivery has to be restricted for absolute indications. There is a need for postpartum guidelines for physical activity which can help women quickly achieve good levels of physical activity.

Key Words : Activities of Daily Living (ADL), Caesarean delivery, Episiotomy, Normal delivery, Tertiary Care Institute

Introduction :

   Caesarean section was first introduced to reduce the risks for the mother and foetus. However, today, C-section is perceived as an escape from labour pain, and the false assumption that C-section is painless, safer, and healthier. Large proportions of the women voluntarily choose C-section as the preferred mode of delivery.

   Many changes occur in the body during pregnancy. Hormonal changes plus fetal growth and development impact the functional ability of the mother during and afterpregnancy. These changes cause secondary effects of pregnancy which include joint laxity, postural changes, muscle imbalances, low back pain, changes in functional ability and psychosocial changes. [1] Lack of physical activity is a problem for women across all age groups [2,3] but is a particular concern for women during pregnancy.[4-7] Moderate to vigorous physical activity during pregnancy has been linked to better health outcomes for mothers and their children and can be protective against the development of chronic illness. [8]

Postpartum physical activity guidelines have the potential to assist women to initiate or resume physical activity following childbirth, so that they can meet recommended levels of physical activity. Health

care providers have a critical role in encouraging women to be active at this time, and the availability of more explicit guidelines may assist them to routinely include physical activity advice in their postpartum care.[9] The postpartum period provides an opportunity for women to begin or reengage in physical activity. The short-term benefits of postpartum physical activity include improvement in mood and cardiorespiratory fitness, promotion of weight loss, and a reduction in postpartum depression and anxiety. [10, 11] Despite these benefits, the majority of women do not resume their pre-pregnancy physical activity levels after the birth of a baby. [12] As the early postpartum period focuses on recovering from delivery and caring for the infant, the importance of resuming physical activity during this time is often not made clear to women, many of whom need guidance to begin or resume physical activity.[13] This period is therefore often a missed life course opportunity for beginning or resuming physical activity. Previously active women who do not resume their pre-pregnancy physical activity levels may remain inactive for many years. The world health organization's guideline on physical activity recommends that adults age18 to 64 years engage in at least 150 minutes of moderate intensity aerobic activitythroughout the week in bouts of at least 10 minutes, or at least 75 minutes of vigorousintensity aerobic activity, or an equivalent combination of the two.[14] Postpartum women may need extra precaution and should seek medical advice before striving to achieve these recommendations.[9] Though women may take longer time to achieve that level of physical activity but they can at least resume their ADL earlier without much of extra supervision by medical experts.

The current study which was carried out amongst the women attending OPD and ward at a tertiary care institute to know the proportion of total deliveries conducted by caesarean section, average time taken for resumption of ADL in all types of deliveries and also whether the resumption of ADL like sleeping, grooming, toileting, cooking, eating, watching TV and many other seated activities are earlier in normal delivery as compared to caesarean delivery or not.

Methods:

A cross-sectional study was carried out amongst 250 women who had delivered within last one year and attended paediatric OPD, paediatric wards and postpartum unit of a tertiary care teaching institute in Ahmedabad city. In absence of reference data for resumption of ADL, the prevalence of 50% was taken as reference and considering the allowable error of 15%, the sample size was calculated as 171. Since undergraduate students were involved in the survey, to make them learn more about communication skills with the community, more number of women were interviewed so as to make total of 250 women. It was decided to include 100 women each from paediatric OPD and PP unit and 50 women from paediatric ward taking sample in proportion to the number of women vising these three places. Survey for the present study was carried out in months of May and June 2017 and interviews were carried out till the desired number of respondents was met as per the sample size mentioned above. A predesigned and pre-tested proforma was used to collect information from each respondent by personal interview method by final year undergraduate students of a medical college. Informed consent was obtained from the respondents before taking their interview.

The proforma included besides socio-demographic profile, information about the resumption of eight ADL. Activities of daily living (ADL) is a term used in healthcare to refer to people'sdaily self-care activities. Professionals often use a person's ability or inability to perform ADL as a measurement of their functional status, particularly in regard to people post injury, with disabilities and the elderly. Resumption time for ADL which were identified, defined and studied in a study by Stucki RA et al, were studied in the present study. [15] For the purpose of simplification and better understanding by the respondents, the definitions were explained by the interviewers during the survey taking examples as will suit the Indian context. Data were analysed using microsoft excel and spss version 17. Calculation of percentages, proportions, mean, SD was carried out and test of significance i.e. SE of difference between two means was applied to find out the significance of difference between mean duration required for resumption of ADL.

ADL definitions [15] for eight activities which were used in present study were as under:

Sleeping	Includes: night rest, taking a nap (either in bed or on the couch). Excludes: Lying down (not sleeping) for recovery.
Grooming	Includes: personal hygiene: showering, toileting, shaving, brushing teeth, and Styling as one activity. Excludes: simple toileting and hand washing.
Toileting	Includes: simple toileting with washing hands. Excludes: other or additional personal hygiene.
Getting ready For bed	Includes: personal hygiene before bedtime. Excludes: pre-bedtime rituals.
Cooking	Includes: Preparing food in the kitchen. Excludes: Cutting pizza from delivery service, making popcorn, etc, making tea or coffee.
Eating	Includes: having a meal (also delivered food). Excludes: snacking (eg, while watching TV), having just a cup of coffee or a glass of water.
Watching TV	Includes: watching TV with main focus on the TV. Excludes: other activities while the TV is just on.
Seated activity	Includes: sitting at a table or in an easy chair while reading, solving a puzzle, doing crosswords, embroidering, doing crafts, or listening to the radio. Excluding: taking a nap.

Results:

The current study which was carried out amongst the women attending OPD and ward at a tertiary care teaching institute in Ahmedabad city to know the proportion of total deliveries conducted by caesarean section, average time taken for resumption of ADL in all types of deliveries and also whether the resumption of ADL like sleeping, grooming, toileting, cooking, eating, watching TV and many other seated activities are earlier in normal delivery as compared to caesarean delivery or not.

Age wise distribution of study population shows that age range of the respondents was 15-44 years. Maximum respondents i.e. 106(42.4%) belonged to age category 20-24 years followed by 97(38.8%) respondents belonging to 25-29 years and only 1(0.4%) respondent belonged to age range 40-44 years. Mean age of study population was 25.03±3.88 yrs. 139(55.6%) resided in Joint family. Education wise distribution shows that maximum i.e. 70(28%) respondents were Illiterate followed by 66(26.4%) who had education up to Primary standards. As far as occupation is concerned, majority 233(93.2%) respondents were housewives. Study population was categorized as per Modified Prasad SES classification. [16] Majority i.e. 163(69.2%) respondents belonged to social classes 2 and 3. (Table1)

Obstetrics history of respondents show that maximum respondents had Gravida 2(32.8%) followed by Gravida 1 (31.2%). Mean Gravida was 2.26±1.2. Maximum respondents had Parity 1 (33.6%), followed by Parity 2 (32.8%). Mean Parity was 2.18±1.16. Maximum respondents had 2 live children (37.2%) followed by 1 live child (34%). Mean live children were 2.04±1. Maximum number of respondents had no Abortion (85.6%). Mean number of abortions was0.18±0.49. (Table2)Majority of respondents had last delivery in last 1 month (38%) followed by in last 1.5-6 months (36%). Most of respondents had their last delivery in tertiary care centre (80.8%). Five deliveries were at home out of the total deliveries.

Table1: Socio-demographic profile of respondents

Sr. No	Variable	Number (n=250)	Per centage
1.	**Age (years)**		
	15-19	11	4.4
	20-24	106	42.4
	25-29	97	38.8
	30-34	29	11.6
	35-39	6	2.4
	40-44	1	0.6
2.	**Type of family**		
	Nuclear	111	44.4
	Joint	139	55.6
3.	**Education**		
	Illiterate	70	28
	Just literate	12	4.8
	Primary	66	26.4
	Secondary	45	18
	Higher secondary	27	10.8
	Under graduation	5	2
	Post graduation	25	10
4.	**Occupation**		
	Housewife	233	93.2
	Service	16	6.4
	Self employed	1	0.4
5.	**Socio-Economic Status (SES) Class**		
	I	8	3.2
	II	75	30
	III	98	39.2
	IV	54	21.6
	V	15	6

Maximum respondents had a Normal Delivery without Episiotomy (42.8%) followed byCaesarean Section (30.8%) and No respondent had Normal Assisted delivery. It was observed that during the

Table2: Distribution of respondents as per Obstetric History

Sr. No	Variable	Number	Percentage
1.	**Gravida**		
	1	78	31.2
	2	82	32.8
	3	55	22
	≥4	35	14
2.	**Parity**		
	1	84	33.6
	2	82	32.8
	3	56	22.4
	≥4	28	11.2
3.	**Live children**		
	1	85	34
	2	93	37.2
	3	54	21.6
	4	15	6
	5	2	0.8
	6	1	0.4
4.	**Abortions**		
	0	214	85.6
	1	27	10.8
	2	8	3.2
	3	1	0.4

period of delivery and postpartum period maximum respondents were taken care of by Relative along with the self-care (43.2%) for performing their ADL. (Table3)

Time taken for resumption of all the ADLs (as defined in the methodology section) was studied in all the respondents. It was observed that the Mean time taken for resumption of ADLs, in all three types of deliveries maximum time was taken to resume cooking (approx. 38 days) and watching TV (approx. 30 days) whereas least time was taken to resume toileting (i.e. 4-12 days).

As far as Sleeping, Grooming, Toileting, Eating, Cooking, Getting ready for bed,Watching TV are concerned there was no significant difference between Normal deliverywithout Episiotomy and Normal delivery with Episiotomy with p value (>0.05)However, the resumption of Seated activity was statistically significantly earlier inNormal

Table 3: Information about last delivery:

Sr. No.	Variable	Number	Percentage
1.	**Time since last delivery (in months)**		
	<1	95	38
	1-1.5	5	2
	1.5-6	90	36
	6-12	60	24
2.	**Place of delivery**		
	Tertiary care centre	202	80.8
	Secondary care centre	9	3.6
	Primary care centre	19	7.6
	Home	5	2
	Private nursing home	15	6
3.	**Type of delivery**		
	Normal		
	With episiotomy	66	26.4
	Without episiotomy	107	42.8
	Normal assisted	0	0
	Caesarean section	77	30.8
4.	**Care taken**		
	Self+relative	108	43.2
	Self+maid	0	0
	Self	56	22.4
	Relative	86	34.4

Delivery without Episiotomy as compared to Normal Delivery with Episiotomy.When the resumption of all the above-mentioned activities were compared betweenNormal Delivery without Episiotomy and Caesarean Section, it was observed that inwomen where delivery was conducted by Caesarean Section all ADL were resumed lateas compared to Normal Delivery without Episiotomy except Watching TV where therewas no significant difference.

In all the 3 types of deliveries, the time taken for resuming TV Watching was almostequal and late (roughly 1 month). The reason may be scarcity of time and not habituatedto watch TV and as such this is non-essential ADL. (Table 4)

Discussion:

The present study was carried out among women in reproductive age group (15-44 years) with mean age of respondent was 25.03±3.88 years. In another study the age range of participants was 28-79 years and mean age was 48.8+20 years.[15] In still another study the age group studied was 22-29 years and the study was a qualitative type of study. [1] The obstetric history of the respondents showed mean gravida of 2.26+1.2, mean parity 2.18+1.6 and mean number of children was 2.04+1 in the present study. In the present study the proportion of caesarean delivery out of total number of deliveries was 30.8% which was higher and the reason may be because the study was in a tertiary care institute which caters to many of the referral cases from the primary and secondary care institutes. Further, the hospital being a teaching institute, provides round the clock, free of cost, and good quality services, thereby facilitate availability and affordability. In addition, emergency ambulance service also functions at zero cost to the patient and makes the hospital easily accessible. The rate of caesarean delivery ranged between 1-15% in a systematic review by Jiang H. [17] In another study the rate of caesarean section was observed as 9.4% and 15.6% in tribal and non-tribal population respectively.[18] The World Health Organization (WHO) has suggested that a caesarean delivery rate of 15% should be taken as a threshold that should not be exceeded – rather than a target to be achieved. [19]

Mean time taken for resumption of eight ADL by women after birth of the baby was studied in the present study. Overall time taken for resumption was lowest for the normal delivery without episiotomy and highest for caesarean delivery. With the increase in proportion of caesarean delivery there is delay in resumption of activities of daily living of the women which reduces autonomy and increases need for care of women and their babies. In a qualitative study amongst nulliparous and post-partum women researcher saw a decline in women's functional ability after pregnancy and thus identified a need for therapeutic intervention. [1] Since it was observed in the present study that all the ADL were resumed late in the caesarean delivery as compared to normal delivery (with or without episiotomy) there is a need

Table 4: Resumption of Activities of Daily Living (ADL) after delivery

Duration of resumption of ADL (Days)								p value of normal delivery without episiotomy versus normal delivery with episiotomy	p value of normal delivery without episiotomy versus caesarean section
Sr No.	Type of ADL	Normal delivery without episiotomy n=107		Normal delivery with episiotomy (n=66)		Caesarean delivery (n=77)			
		Mean	SD	Mean	SD	Mean	SD		
1	Sleeping	11.54	17.67	13.86	28.12	19.29	32.96	0.5058	0.0353
2	Grooming	8.32	9.43	8.35	12.16	22.74	30.15	0.9855	<0.0001
3	Toileting	5.34	7.88	4.18	5.96	12.07	14.38	0.3055	0.0001
4	Getting ready for bed	7.63	6.84	12.43	27.22	16.86	17.63	0.0817	<0.0001
5	Cooking	39.99	30.77	37.3	21.2	58.70	37.34	0.5230	0.0004
6	Eating	10.48	13.19	10.12	15.12	17.38	20.77	0.8638	0.0082
7	Watching TV	31.68	20.86	33.09	10.61	29.00	13.28	0.5869	0.3521
8	Seated activity	16.66	19.66	24.84	17.62	27.88	30.30	0.0041	0.0027

to sensitize all the health care providers to restrict the use of caesarean delivery to their absolute indications only.

In a systematic review, guidelines of six countries regarding resumption of physical activities during post-partum period are mentioned and the Australian, Canadian, and UK guidelines considered type of delivery, and suggested that women who experienced a caesarean should consult with their healthcare professional about resumption of physical activity. None of the guidelines specified different recommendations for women who had a vaginal delivery but required stitches. [9] However, the guidelines for physical activities during postpartum period are currently not there in our country and there is a need to formulate the same.

Conclusions:

Postpartum guidelines for physical activity should be made available for our country which will help women quickly achieve levels of physical activity that are commensurate with all other adults. Postpartum physical activity guidelines have the potential to assist women to initiate or resume physical activity following childbirth, so that they can transition to meet recommended levels of physical activity. Health

care providers have a critical role in encouraging women to be active at this time, and the availability of more explicit guidelines may assist them to routinely include physical activity advice in their postpartum care after normal delivery and delivery by caesarean section. Further, the proportion of caesarean delivery has to be restricted for absolute indications.

Declaration:

Funding: Nil

Conflict of interest: Nil

References:

1. Post pregnancy functional ability as available on https://scholarworks.gvsu.edu/cgi/viewcontent.cgi?article=1370andcontext=theses accessed on 26/09/19

2. Scharff D, Homan S, Kreuter M, et al. Factors associated with physical activity in women across the life span: Implications for program development. Women Health. 1999; 29(2):115–134.]

3. Lloyd-Jones D, Adams R, Brown T, et al. Heart disease and stroke statistics--2011 update. A report from the American Heart Association. Circulation. 2011; 123(4):e18–e209.

4. Evenson K, Wen F. National trends in self-reported physical activity and sedentary behaviors among pregnant women: NHANES 1999–2006. Prev Med. 2010; 50(3):123–128.

5. Evenson K. Towards an Understanding of Change in Physical Activity from Pregnancy Through Postpartum. Psychol Sport Exerc. 2011; 12(1):36–45.

6. Borodulin K, Evenson K, Herring A. Physical activity patterns during pregnancy through postpartum. BMC Womens Health. 2009; 9(1):32.

7. Pereira MA, Rifas-Shiman SL, Kleinman KP, et al. Predictors of Change in Physical Activity During and After Pregnancy:: Project Viva. Am J Prev Med. 2007; 32(4):312–319.

8. Pearce EE, Evenson KR, Downs DS, Steckler A. Strategies to promote physical activity during pregnancy. American journal of lifestyle medicine. 2013 Jan;7(1):38-50.

9. Evenson KR, Mottola MF, Owe KM, Rousham EK, Brown WJ. Summary of international guidelines for physical activity following pregnancy. Obstetrical and gynecological survey. 2014 Jul;69(7):407.

10. Mottola MF. Exercise in the postpartum period: practical applications. Curr Sports Med Rep. 2002;1(6):362–8.

11. U.S. Department of Health and Human Services. Physical Activity Guidelines Advisory Committee . Physical Activity Guidelines Advisory Committee Report, 2008. Washington DC: 2008. Accessed at http://www.health.gov/PAguidelines/Report/

12. Olson C, Strawderman M, Hinton P, Pearson T. Gestational weight gain and postpartum behaviors associated with weight change from early pregnancy to 1 year postpartum. Intl J Obesity. 2003;27:117–27.

13. Minig L, Trimble EL, Sarsotti C, Sebastiani MM, Spong CY. Building the evidence base for postoperative and postpartum advice. Obstet Gynecol. 2009;114(4):892–900.

14. World Health Organization . Global Recommendations on Physical Activity for Health. Geneva, Switzerland: 2010. Accessed at http://whqlibdoc.who.int/publications/2010/9789241599979_eng.pdf.

15. Stucki RA, Urwyler P, Rampa L, Müri R, Mosimann UP, Nef T. A web-based non-intrusive ambient system to measure and classify activities of daily living. Journal of medical Internet research. 2014;16(7):e175.

16. Mangal A, Kumar V, Panesar S, Talwar R, Raut D, Singh S. Updated BG Prasad socioeconomic classification, 2014: A commentary. Indian journal of public health. 2015 Jan 1;59(1):42.

17. Jiang H, Qian X, Carroli G, Garner P. Selective versus routine use of episiotomy for vaginal birth. Cochrane Database of Systematic Reviews. 2017(2).

18. Desai G, Anand A, Modi D, Shah S, Shah K, Shah A, Desai S, Shah P. Rates, indications, and outcomes of caesarean section deliveries: A comparison of tribal and non-tribal women in Gujarat, India. PloS one. 2017 Dec 27;12(12):e0189260.

19. World Health Organization. WHO Statement on Caesarean Section Rates: Geneva, Switzerland; 2015. available on http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/cs-statement/en/ accessed on 27/11/2019

A Cohort Study of Pregnancy Outcomes in Rural Area of Gandhinagar, Gujarat

Gneyaa Bhatt[1], Manish Rana[1], Azbah Pirzada[2], Roshni Dave[2], Nikesh Agrawal[3]

[1]Assistant Professor, [2]Lady Medical Officer, [3]Associate Professor, Department of Community Medicine,

GMERS Medical College, Sola, Ahmedabad, Gujarat, India

Correspondence : Dr. Manish Rana, E mail:drmanishrana@gmail.com

Abstract :

Introduction: In India, infant and maternal deaths go unreported with disparities in reporting systems between Health system & Civil Registration System (CRS). This study was undertaken to find out pregnancy outcomes, gaps in the reporting and understand medical and social causes of infant and maternal deaths. **Method:** A total of 874 antenatal women from a PHC area were interviewed. They were contacted after one month of expected date of delivery (EDD) to get the details of pregnancy outcome. For all the live babies, follow up was done six monthly up to age of completed one year to report any infant or maternal death. In case of mortality, Maternal or Infant death review was conducted using standardized formats of GOI to find out probable cause of death and associated factors. Such deaths were cross checked with data of PHC and gram panchayat. **Results:** There were 830 (6 twin births) live births, 2 still births and 48 abortions. Among the live births, 19 infant deaths (14 male, 4 female and 1 ambigous genitalis) were found, of which, 12 were neonatal deaths. 12 infant deaths were reported at PHC and no deaths were reported at Panchayat. Various causes for infant deaths were infection, congenital anomaly, preterm birth, birth asphyxia, Rh incompatibility etc. One late maternal death was observed and the cause was SLE with lupus nephritis. **Conclusion:** There is a opportunity for improvement in the reporting of pregnancy outcomes as well as reporting of pregnancy intrinsically. The deaths can be further reduced by addressing the first delay and correcting the delays/faults at the health facility level.

Key Words : Cohort, Infant death, Maternal Death, Pregnancy outcome

Introduction :

In India, Infant Mortality Rate (IMR) and Maternal Mortality Rate (MMR) have been declined considerably from 80[1] (1991) to 33[2] (2017) per 1000 live births and 556[3] (1991) to 131[4] per 100000 live births (2014-16) respectively. Gujarat has an IMR of 30 per 1000 live births (36 & 22 for rural and urban areas respectively) and MMR of 122 per 1000 live births,[2, 4] lower than the national average but is considerably high when compared with the developed countries. In India, maternal and child deaths are reported in namely 3 systems: (i) Health system, (ii) Integrated Child Development Services (ICDS) scheme and (iii) Civil Registration System (CRS). There have been no linkages among these systems and also, there are gaps among these systems. Many a times, infant and maternal deaths go unreported. It is important to find out such gaps locally to have maximally reliable reporting system which can provide the accurate action oriented
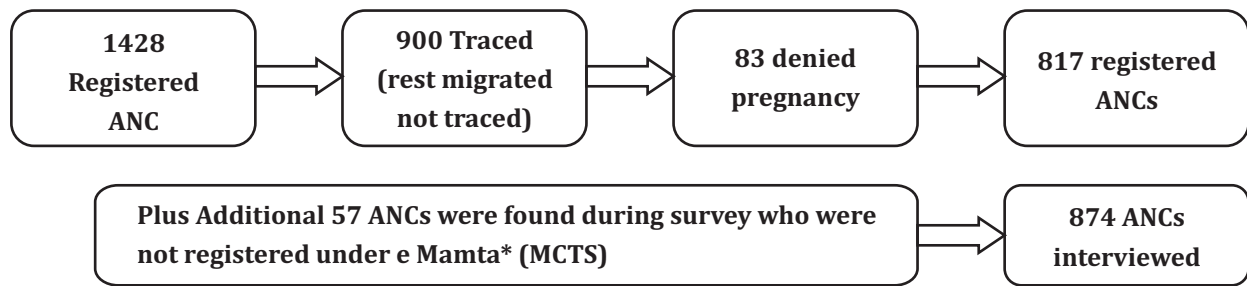
information[5]. As the antenatal services are considered to be good and the gaps are usually in intranatal & postnatal services, the study was proposed to follow the registered antenatal women to study pregnancy outcome. Again it is also important to know about medical and social causes of infant and maternal deaths. Hence, this study was planned with following objectives:

1. To find out pregnancy outcome among registered Antenatal women in the form of live birth, abortions, still births, infant deaths & maternal deaths in the study area.

2. To know about medical and social causes of infant and maternal deaths.

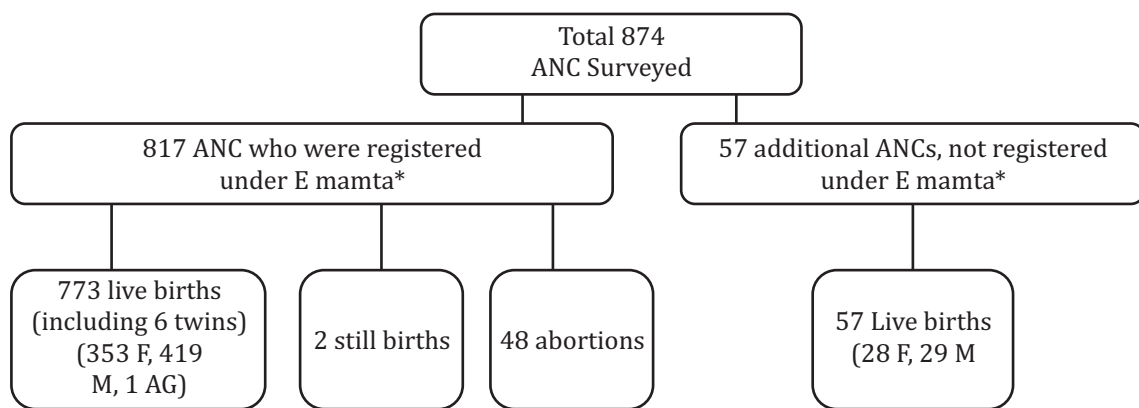3. To study gap in different maternal & infant death reporting systems.

Method:

The study was carried out in all 19 villages of a PHC of Gandhinagar, which happens to be the Rural

Figure 1: ANCs covered in the study


```
┌──────────────┐     ┌──────────────┐     ┌──────────────┐     ┌──────────────┐
│     1428     │ ──▶ │  900 Traced  │ ──▶ │  83 denied   │ ──▶ │ 817 registered│
│  Registered  │     │ (rest migrated│     │  pregnancy   │     │    ANCs      │
│     ANC      │     │  not traced) │     │              │     │              │
└──────────────┘     └──────────────┘     └──────────────┘     └──────────────┘
```

```
┌────────────────────────────────────────────────┐     ┌──────────────┐
│  Plus Additional 57 ANCs were found during      │ ──▶ │  874 ANCs    │
│  survey who were not registered under e Mamta*  │     │ interviewed  │
│  (MCTS)                                         │     │              │
└────────────────────────────────────────────────┘     └──────────────┘
```

*E mamta- Mother child tracking system (MCTS) of Gujarat

Figure 2: Outcomes of pregnancy


```
                          ┌──────────────┐
                          │  Total 874   │
                          │ ANC Surveyed │
                          └──────────────┘
            ┌───────────────────┴─────────────────────┐
┌───────────────────────┐               ┌───────────────────────┐
│ 817 ANC who were      │               │ 57 additional ANCs,   │
│ registered under      │               │ not registered        │
│ E mamta*              │               │ under E mamta*        │
└───────────────────────┘               └───────────────────────┘
     ┌──────┬────────┬────────┐                    │
┌──────────┐ ┌──────────┐ ┌──────────┐      ┌──────────────┐
│773 live  │ │2 still   │ │48        │      │57 Live births│
│births    │ │births    │ │abortions │      │(28 F, 29 M   │
│(including │ └──────────┘ └──────────┘      └──────────────┘
│6 twins)  │
│(353 F,   │
│419 M, 1 AG)│
└──────────┘
```

*E mamta- Mother child tracking system (MCTS) of Gujarat

Health Training Centre (RHTC) of the college. All ANC females registered during financial year 2014-2015 at that PHC were included in the study. A total of 1428 ANCs were registered during this period. (Figure 1)

During first visit, their expected date of delivery (EDD) was noted and ANC women were contacted after 1 month of EDD to get the details of pregnancy outcome (maternal & foetal both). In case, pregnant mothers had already delivered during first visit, detail of pregnancy outcome was noted in the first visit itself.

For all the live babies, date of birth was noted and follow up was done 6 monthly up to the age of completed 1 year to report any infant or maternal deaths. In case of mortality (maternal / infant), Maternal or Infant death review using standard GOI formats[6, 7] was carried out to find out probable cause of death and associated factors. Any maternal or infant death found during study were cross checked with data of PHC and gram panchayat (talati).

Data was collected by trained paramedical staff of department and death reviews were conducted by lady medical officers and/or assistant professors of the department. Data thus collected was entered in MS Excel for descriptive analysis. For the identification of the causes/delays/contributing factors for infant/maternal deaths, case based analysis was done.

Results:

Out of 874 (817+ 57) ANCs surveyed, 830 live births were found giving birth rate of 20.0 per 1000 population. There were 381 female births, 448 male births and 1 birth with ambiguous genitalis which makes sex ratio at birth of 850 females per 1000 males. (figure 2)

At the age of 1 year, total of 19 infant deaths were found with 12 (63%) in neonatal period. There were more male deaths (73.7%) than female.IMR comes out to be 22.9 per 1000 live births (Table 1). Of 19 infant deaths, 12 (63%) deaths were reported at PHC and zero deaths were reported at Gram Panchayats.

Table 1: Outcomes among the live births at the age of 1 year

Outcomes among registered ANCs				
Outcome	**Male**	**Female**	**Others**	**Total**
Infant deaths	12	4	1 (Ambiguous genitalis)	17
a. Early Neonatal deaths	5	3	-	8
b. Late neonatal deaths	3	0	1	4
c. Post neonatal deaths	4	1	-	5
Alive	407	349	0	756
Outcome among additional pregnancies				
Infant deaths	2	0		2
a. Post neonatal deaths	2	0		2
Alive	27	28		55

Table 2: Causes and contributing factors for each Infant death

Infant deaths	Causes	Case Specific Any delay/contributing factors/social determinants
Early Neonatal (8, 42%) M-5,F- 3	a. Congenital anomaly (Tracheooeso-phageal Fistula)	a. Detection of anomaly by early antenatal USG and corrective surgery can be planned on day of birth.
	b. Congenital anomaly (Anhydramnios, Lung hypoplasia, both kidney & bladder not seen in 19wks USG)	b. Detection of anomaly by early antenatal USG and termination of pregnancy can be done.
	c. Congenital Anomaly- GI tract anomaly (jejunoileal /Deodenal /colon atresia)	c. Detection of anomaly by early antenatal USG for termination of pregnancy or planning of surgery on day of birth
	d. Birth Asphyxia	d. Prolonged labour. Delay in referring from PHC. Partograph can be of help in such cases.
	e. Birth asphyxia leading to hypoxic ischemic encephalopathy	e. From the history, No amenable intervention
	f. Hydrops foetalis	f. This was 4th pregnancy and Anti D was not given following one of the pregnancies.
	g. Hypovolemic shock due to delayed feeding with probable hypoglycemia	g. Delay in seeking treatment. (Initiation of breastfeeding on 4th day. On 5th day, baby stopped feeding, & developed drowsiness. Child was taken to hospital on 6th day.)
	h. Pre term delivery (28 weeks)	h. VLBW (1.7 kg)

Late neonatal (4, 21%) M- 3, F-0, AG-1	a.	Possible serious bacterial Infection	a.	Delay in seeking care as mother was unaware of danger signs. LBW, no EBF, Teenage pregnancy
	b.	Preterm (7 months)	b.	ELBW (900 gms), Baby was given powdered milk after 1 day. Teenage pregnancy.
	c.	Pre term (26 weeks), Congenital Anomaly-Ambiguous genitalis with Ascites	c.	Detection of anomaly by early antenatal USG for termination of pregnancy or for preparation of proper management from the day of birth.
	d.	Acute diarrheal disease	d.	No EBF. No other contributing factors found.
Post neonatal (7, 37%) M-4, F- 1	a.	Not taking feed/ persistent vomiting /prerenal failure	a.	Delay in seeking care and refusal for hospital admission by parents.
	b	Acute Diarrhoeal disease	b.	Child was never breastfed as mother had active tuberculosis. Child stopped taking feed but private hospital didn't admit the patient as per the respondent and child died at home.
	c.	Fever with diarrhea	c.	No delay / contributing factors found.
	d.	Fever with seizures	d.	–do-
	e.	Typhoid fever	e.	–do-
	f.	Congenital heart disease/ pneumonia	f.	Delay in seeking care. Baby was having excessive cry since 10 days, parents decided to seek care when he developed breathing difficulty and chest in drawing.
	g.	Failure to thrive and abdominal distension	g.	Child was never breastfed as mother had SLE. Infant had vomiting since birth. No vaccine was given. Mother died at 6 weeks after delivery. H/o alcoholism and smoking in family (father).

Table 3: Detail of Maternal death

Age of mother	Time of death	Cause of death	Remarks
22	43rd day (late maternal death)	SLE + Lupus nephritis	Pre-existing SLE which got worsened following delivery.

From the death reviews, various causes for infant deaths found in descending order were infections, preterm birth, congenital anomaly, birth asphyxia, Rh incompatibility etc. Each of the deaths was assessed for the presence of contributing factors and/or delay and are mentioned in table 2.

One maternal death was found on 43rd day of delivery, which is considered as late maternal death,[8] detail of which is mentioned in table 3. This death was also not reported at PHC or Gram Panchayat.

Discussion:

The study was conducted among 874 ANCs of a PHC catchment area. Among these 6.5% ANCs were not registered under Government MCTS and found during the survey. 830 live births, 2 still births and 48 abortions were outcome of these 874 ANCs. Birth rate in the study was 20.0 which is lower than the national estimate of rural area [9] (22.1). Sex Ratio at birth in our study is quite low (850) than the national average [9] of 898 (2014- 2016). Lower sex ratio suggest male child preference in the community which is indirectly reflected in abortion rate (5.2 per 1000 females of reproductive age group) and furthermore 83 registered ANCs who denied being pregnant (figure 1), might have terminated their pregnancy and probably concealed their abortion. There could be a likelihood of unsafe abortion in these cases and probably they might not want to disclose their pregnancy. 19 infant deaths (830 live births) were detected, among which 63% of deaths were in neonatal period, out of which, 66.7% deaths were in first week of life. In contrast analysis of DLHS 4 [10] showed 39.4% of deaths in neonatal period, of which 73% were in the first week of life. IMR in our study was 22.9 and NMR was 14.5 per 1000 live births. Both are lower as compared to SRS estimate of rural area in 2016[9]. Both the rates are comparable to SRS estimates of urban area[9], which is probably due close proximity of PHC to Ahmedabad city. As per SDGs [11], the goal is to reduce NMR to 12 by 2030, which is achievable, provided the preventable causes get addressed. Various studies[12, 13] have shown higher mortality in females during infancy, while in our study, 74% of infant deaths were male child, reflecting adequate care of girl child in desired families.

As per WHO, deaths of children within the first 28 days of birth are associated with lack of quality care at birth or skilled care and treatment immediately after birth and during the first few days of life[14]. Causes for neonatal deaths in our study in descending order were preterm birth (25%), congenital anomaly (25%), infection (17%)(diarrhoea and possible serious bacterial infection), birth asphyxia (17%)

followed by Rh incompatibility (8%) and hypovolemic shock/hypoglycemia (8%). All these births took place at health care facility (10 in private hospital, 2 in government hospital). Causes for post neonatal deaths were infections in 57% of cases (fever, diarrhoea, typhoid etc) and others were prerenal failure, congenital heart disease and failure to thrive. During 2008-12 in study of North India13, birth asphyxia (31.5%) followed by low birth weight (LBW)/prematurity (26.5%) were the most common causes of neonatal death, while infection (57.8%) was the most common cause of post-neonatal death. As per DLHS 410, Birth injuries, low birth weight and neonatal infections were the leading causes of neonatal deaths. Acute respiratory infection was the most common cause of post-neonatal deaths.

No delay was found in 42.1% (8) deaths among which 4 cases were of congenital anomaly, where early antenatal USG can help in detection and planning for either termination of pregnancy or surgery on day of birth. Other cases were of birth asphyxia, fever and diarrhoea. Similar result was there in study of North India[13], where delay was not observed at any level in 47% (24) deaths and among which, the most common cause of death was congenital malformation and birth asphyxia.

Delay in seeking care (1st delay) was found in 21% (4) of deaths (in 16.6% of neonatal deaths & in 28.5% of post neonatal deaths), delay in reaching the health care facility (2nd delay) was, not associated with any deaths. However, there were 5 deaths which happened on the way to health care facility in which either there was presence of first delay also or it happened during the way from one health facility to the next. Delay at health care facility (3rd delay) in receiving care was not directly linked. However, some lacunas were identified in 3 cases: i) anti D was not given to Rh negative mother in previous delivery leading to hydrops foetalis in current baby, ii) a child having diarrhoea with poor feeding and fluid intake was not admitted at the health facility, iii) staff at the facility failed to identify prolonged labour leading to foetal distress. Study of North India [13] showed delay at level 1 as most common and occurred in 32.4% of neonatal deaths and 29.4% of post-neonatal deaths. Delay levels 1, 2 and 3 were reported among 14 (27.5%), 4 (7.8%) and 4 (7.8%) deaths, respectively.

In our study one late maternal death [8] was found

on 43rd day of delivery in which cause of death was systemic lupus erythematosus (SLE) with lupus nephritis. SLE is mentioned under common indirect causes of maternal death in ICD MM. [8] Pregnancy constitutes a major challenge for women with SLE when compared with other women, resulting in some life threatening complications i.e. severe kidney, lung or heart disease. [15] A study on pregnancy outcomes of lupus showed a significantly greater proportion of preterm births, growth restriction and infants in the very low birth weight category among lupus affected pregnancies compared with the control group. [16] In our study, the infant of this patient died at the age of 4 months.

Conclusion & recommendations:

1. IMR and NMR in the study area were comparable to the estimates of urban area. 63% of deaths were in neonatal period.

2. Out of total 19 infant deaths, at least 7 deaths were evidently preventable. These were either because of delay in seeking care (because of unawareness regarding danger signs) or delay/ faulty practice at health care facility i.e. lack of administration of Anti D after each delivery in case of Rh negative mother, no use of partograph at health care facility to detect prolonged labour and timely referral. Strengthening of home based newborn care (HBNC) is essential for early detection of danger signs in the infants once discharged from facility.

3. For congenital anomaly, early detection can help to reduce mortality either by termination of pregnancy or by planning of appropriate surgery after birth based on the type of anomaly.

4. Reporting of deaths need to be strengthened as 63% of deaths were reported at PHC and no infant deaths were reported at Panchayat.

5. One late maternal death was found and the cause being SLE is an indirect cause of maternal death.

6. Study could find 57 additional pregnancies which were not registered under E mamta (MCTS). So reporting of missed pregnancies requires cross validation of reported data by supervisor or medical officer to fill up the gap.

References:

1. An Analysis of Levels and Trends in Infant and Child Mortality Rates in India. 2014 National Institute of Public Cooperation and Child Development, New Delhi. Available at: http://www.nipccd.nic.in/reports/imr.pdf

2. Infant Mortality Rate. SRS bulletin, Vol 52, No.1; May 2019. Office of Registrar General, India. Ministry of Home Affairs, Govt. of India. Available at: http://www.censusindia.gov.in/vital_statistics/SRS_Bulletins/SRS_Bulletin-Rate-2017-_May_2019.pdf Accessed on 26th June, 2019

3. WHO, UNICEF, UNFPA, World Bank Group, and the United Nations Population Division. Trends in Maternal Mortality: 1990 to 2015. Geneva, World Health Organization, 2015. Available at: https://data.worldbank.org/indicator/SH.STA.MMRT

4. Special bulletin on Maternal Mortality in India 2014-2016, May 2018. Office of Registrar General, India. Ministry of Home Affairs, Govt. of India. Available at: http://www.censusindia.gov.in/vital_statistics/SRS_Bulletins/MMR%20Bulletin-2014-16.pdf

5. Amul Patel, Pradeep Kumar, Naresh Godara, and Vikas K Desai. Infant Deaths – Data Disparity and Use of Ante, Intra and Post-natal Services Utilization: An Experience from Tribal Areas of Gujarat. Indian J Community Med. 2013 Jul-Sep; 38(3): 152–156.

6. Child death review: operational guidelines; Aug 2014, Ministry of health and family welfare, GOI

7. Maternal Death Review Guidebook, Ministry of health and family welfare, GOI

8. The WHO Application of ICD-10 to deaths during pregnancy, childbirth and the puerperium: ICD-MM. World health Organization, 2012. Available at: https://www.who.int/ reproductivehealth /publications/monitoring/9789241548458/en/

9. SRS statistical report 2016. Available at: http://www.censusindia.gov.in/vital_statistics/SRS_Report_2016/4.Executive_Summary_2016.pdf

10. Tripathy JP, Mishra S, Causes and Predictors of Neonatal, Post-neonatal and Maternal Deaths in India: Analysis of a Nationwide District-Level Household Survey-4 (DLHS-4), 2012-13.J Trop Pediatr. 2017 Mar 2. doi: 10.1093/tropej/fmx009. [Epub ahead of print]

11. Goal 3: Ensure healthy lives and promote well-being for all at all ages. Avaialble at: https://www.un.org/ sustainabledevelopment /health/

12. Shah MS, Khaliue N, Khan Z, Amir A. A community based study of Infant Mortality from rural Aligarh. AMJ 2011, 4, 1, 22-25

13. Rai SK, Kant S, Srivastava R, et al. Causes of and contributors to infant mortality in a rural community of North India: evidence from verbal and social autopsy. BMJ Open 2017;7:e012856.

14. Newborns: reducing mortality. Available at: https://www.who.int/news-room/fact-sheets/detail/newborns-reducing mortality

15. Irene Iozza,Stefano Cianci,Angela Di Natale,Giovanna Garofalo,Anna Maria Giacobbe et al. Update on systemic lupus erythematosus pregnancy. J Prenat Med. 2010 Oct-Dec; 4(4): 67–73. Available at: https://www.ncbi.nlm.nih.gov /pmc/articles/PMC3279186/

16. Dhar JP, Essenmacher LM, Ager JW, Sokol RJ. Pregnancy outcomes before and after a diagnosis of systemic lupus erythematosus. Am J Obstet Gynecol. 2005 Oct; 193(4):1444-55. Available at: https://www.ncbi.nlm.nih.gov/pubmed/ 16202739

INSTRUCTIONS FOR AUTHORS

"Healthline" is a biannual national journal of Indian Association of Preventive and Social Medicine. "Healthline" aims to promote quality research in the field of Community Medicine and Public health. The editorial board of the journal is committed to an unbiased, independent, anonymous and confidential review of submitted articles. Manuscripts submitted to this Journal, should not have been published or under consideration for publication in any substantial form in any other publication, professional or lay. All the manuscripts once submitted to and published in the Healthline will become the property of the journal.

Aims and Objectives of the Journal:

The "Healthline" journal aims at promotion of high quality medical research by

· Ensuring the accessibility to novel ideas, observations and advanced knowledge for all by adopting open access policy

· Providing a platform to researches in Community Medicine and Public Health

· Improving the visibility of public health issues for concerned stake holders

Process for submission:

Authors are requested to strictly follow the guidelines provided herewith, while preparing the manuscripts for submission to the "Healthline" journal.

Editorial and Peer Review Policy:

The "Heathline" journal follows double blind peer review process. Following receipt of a manuscript from the authors, the manuscript undergoes an editorial review (by editor in chief/executive editor/joint editor). If the manuscript is found appropriate for the further process following the editorial review, the blind manuscript is sent to two anonymous peer reviewers and one statistical reviewer. It is ensured that the reviewers are having qualifications of post-graduation or higher in the concerned subjects and not from the same institute where the authors belong. Upon completion of peer review, the changes suggested by the reviewers are forwarded to the authors and modifications are sought with explanations (if required). The revised manuscript is again forwarded to the concerned reviewers. If the reviewers are satisfied with the revisions from the authors, the manuscript is accepted and formative changes are done for the publication. At any stage of review, if editorial board members or reviewers find the manuscript unsuitable for the publication, the manuscript is rejected.

General Instructions:

The manuscript can be submitted through email to editorhealthline@gmail.com. The email should contain soft copies of authorship and copyright form (duly signed by all the authors), title page and original manuscript in separate documents. Authors are requested to prepare the article typed in "Times New Roman" fonts with size of "12". Double spacing (including references), should be followed with wide margins. There is no need to send a hard copy.

For any query, kindly reach editorial office through e mail at editorhealthline@gmail.com.

Preparation of Manuscript

Following are the word limits to be followed while submitting an article.

Type of Article	Maximum Word Limit
Editorial (by invitation only)	1500
Continuing Medical Education /Review article	4500
Original article *	3000
Short article	1500
Letter to Editor	750
Book review (should not be sponsored by any company/organization)	500

*Excluding abstract, references, tables and images

Manuscript should be prepared using American English language. Articles exceeding the word limit for a particular category of manuscript would not be processed further. Uniform Requirements for

Manuscripts (URM) submitted to Biomedical Journals should be consulted before submission of manuscript (http://www.icmje.org).

Ethical Issues :

All articles should mention how human and animal ethical aspect of the study was addressed. Whether informed consent was taken or not. Identifying details should be omitted if they are not essential. When reporting experiment on human subjects, authors should indicate whether the procedures followed were in accordance with the Helsinki Declaration of 1975, as revised in 2000. (http://www.wma.net).

Each of the following sections should begin on a separate page. Number all pages in sequence.

Title page :

This should contain the title of the manuscript, name and designation of all the authors, a short title (not more than 40 letters) to be used as the running title, source of support in the form of grants, equipments, drugs etc., acknowledgement, the institution where the work has been carried out and the address with contact number and email ID of the corresponding author. There should also be mention of life membership number of first or second author with IAPSM-GC. Articles not containing life membership number of first or second author in the title page will be charged publication fees according to criteria for non member authors. Briefly mention contribution of each author in multi author article.

Abstract :

Abstract should be a structured condensation of the work not exceeding 250 words for original research articles and 150 words for short articles. It should be structured under the following headings: background, objectives, methods, results, conclusions, and 3- 5 keywords to index the subject matter of the article. Please do not make any other heading.

Manuscript :

It must be concise and should include title, introduction, material and methods, result, discussion, conclusion, recommendations and references. The manuscript should not contain

names or any other information related to authors. The matter must be written in a manner, which is easy to understand, and should be restricted to the topic being presented. Each Table and Figure should be on separate page and should be given at the end of the manuscript. Please do not insert tables etc. within the text. These should be placed as the last element of the text before references. Written permissions of persons/agency acknowledged should be provided, if applicable.

Conflict of interest and financial support :

The situations where conflict of interest arises are when an author (or the author's institution), reviewer, or editor has financial or personal relationships that inappropriately influence (bias) his or her actions (such relationships are also known as dual commitments, competing interests, or competing loyalties). The potential of influences can vary from the insignificant ones to the significant ones where the results of the reviews or publication process. The conflict of interest can also occur if an individual believes that the relationship affects his or her scientific judgment. Financial relationships (such as employment, consultancies, stock ownership, honoraria, paid expert testimony) are also one of the identifiable conflicts of interest and the most likely to undermine the credibility of the journal, the authors, and of science itself. The other potential conflicts can occur for other reasons, such as academic rivalry, personal relationships and intellectual desire. (Source: International Committee of Medical Journal Editors ("Uniform Requirements for Manuscripts Submitted to Biomedical Journals"), February 2006) A brief statement on source of funding and conflict of interest should be included in the manuscript.

Published Statement of Informed Consent :

The involvement of study participants should be voluntary and following informed consent. Any details disclosing identification of the patients (names, record numbers, contact details, photographs and pedigree) must not be included in the published article. In case, such information is necessary for scientific reasons, an informed consent must be obtained from the study participants or parents/guardian (in case of children less than 18 years of age). Informed consent for this purpose

requires that a patient who is identifiable be shown the manuscript to be published. Authors should identify individuals who provide writing assistance and disclose the funding source for this assistance. Identifying details should be omitted if they are not essential. Complete anonymity is difficult to achieve, however, and informed consent should be obtained if there is any doubt. If identifying characteristics are altered to protect anonymity, authors should provide assurance that alterations do not distort scientific meaning and editors should so note. When informed consent has been obtained it should be indicated in the published article. (Source: International Committee of Medical Journal Editors ("Uniform Requirements for Manuscripts Submitted to Biomedical Journals"), February 2006)

Data Sharing Policy :

The authors must submit a statement of data sharing that, the data pertaining to original articles, published in "Healthline" journal must be provided, without restrictions, whenever asked for by the editorial board of the journal. Failure to comply this condition may lead to rejection of the article.

References :

In citing other work, only reference consulted in original should be included. If it is against citation by others, this should be so stated. Signed permission is required for use of data from persons cited in personal communication. ANSI standard style adapted by the National Library of Medicine (NLM) should be followed. Consult http://www.nlm.nih.gov/bsd/uniform_requirements.html. References should be numbered and listed consecutively in the order in which they are first cited in the text and should be identified in the text, tables and legends by Arabic numerals as **superscripts in square brackets (as example shown below)**. The full list of reference at the end of the paper should include; names and initials of all authors up to six (if more than 6, only the first 6 are given followed by et al.); the title of the paper, the journal title abbreviation according to the style of Index Medicus (http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=journals), year of publication; volume number; first and last page numbers. Reference of books should give the names

and initials of the authors, book title, place of publication, publisher and year; those with multiple authors should also include the chapter title, first and last page numbers and names and initials of editors. For citing website references, give the complete URL of the website, followed by date of accession of the website. Quote such references as - author name, title of the article, the website address, and date of accession.

Citation : Several research studies have revealed gap between facts and beliefs of adolescent girls and showed that there is low level of awareness about menstruation among girls when they first experience it. [4]

Journals : Mehta MN, Mehta NJ. Serum lipids and ABO Blood group in cord blood of neonates. Indian J Pediatr. 1984; 51:39-43.

Book : Smith GDL. Chronic ear disease. Edinburgh: Churchill Livingstone; 1980.

Chapter in the Book : Malhotra KC. Medicogenetics. problems of Indian tribes. In: Verma IC, editor. Medical genetics in India. vol. 2. Pondicherry: Auroma Entrprises; 1978. p. 51-55.

Papers accepted but not yet published should be included in the references followed by 'in press". Those in preparation, personal communications and unpublished observations should be referred to as such in the text only.

Illustrations (Maximum 4):

These should be of the highest quality, preferably black and white and editable. Graphs should be drawn by the artist or prepared using standard computer software. Number all illustrations with Arabic numerals (1, 2, 3....).

Legends :

A descriptive legend must accompany each illustration and must define all abbreviations used therein.

Tables (Maximum 4) :

These must be self–explanatory and must not duplicate information in the text. Each table must have a title and should be numbered with Arabic numerals. Each table should be typed in double space,

on a separate sheet of paper. No internal horizontal or vertical lines should be used. All tables should be cited in the text.

Abbreviation :

As there are no universally accepted abbreviations, authors should use familiar ones and should define them when used first in the text.

Manuscript Processing Charges :

As per the 22nd General Body Meeting of IAPSM-GC, manuscript processing charges will be applicable to the publications in "Healthline" journal, as mentioned below, with effect from 1st issue of volume 6 of Healthline Journal.

Criteria	Applicable charges/ article
First or Second Author with IAPSM-GC membership	Rs. 1000
First or Second Author without IAPSM-GC membership	Rs. 1500

The manuscript processing charges as mentioned above can be paid by cheque / online transfer in favour of below mentioned account.

Name of Account : HEALTHLINE IAPSMGC

Account Number : 34898725422

IFSC Code : SBIN0003043

Address : State Bank of India, Civil Hospital Precincts Branch, Opp. B. J. Medical College, PO Bag No. 1, Ahmedabad-380016

MICR Code: 380002011

Following online payment of manuscript processing charges, the receipt of fund transfer should be emailed to editorhealthline@gmail.com.

If paid by cheque, duly prepared cheques should be sent to **Dr. K. N. Sonaliya, Editor in chief, Community Medicine Department, GCS Medical College, Opp. DRM Office, Nr. Chamunda Bridge, Naroda Road, Ahmedabad-380025, Gujarat, India.**

Advertisement Policy:

Being a national journal of Indian Association of Preventive and Social Medicine, "Healthline" has a reach to more than 4200 members of IAPSM, government health officials, Post Graduate students, epidemiologists, medical institutions and medical faculties across the country. It can provide a highly cost effective mode of advertising and passing the desired message to the targeted population.

"Healthline" provides the option of print advertisement on the pages of the printed issues of the journal. The rates for the same are as below.Advertisement TypeCharges (INR) per IssueInner Back Cover10000Outer Back Cover 25000 For advertisement or any query, please contact,

Editor in Chief, "Healthline" journal, Professor & Head, Community Medicine Department, GCS Medical College, Opp. DRM Office, Naroda Road, Ahmedabad-380025

Email: editorhealthline@gmail.com,

Contact no.: +917966048351

Corrigendum

Healthline journal Volume 9, Issue 1 (January-June 2018) Page no.17

It was printed as "Anjali Mall, Assistant Professor, P.S.M Department, B.J. Medical College, Ahmedabad, Gujarat, India"

Kindly Read the same as "Anjali Singh, PhD student (Gujarat University), Assistant Professor, P.S.M Department, B.J. Medical College, Ahmedabad, Gujarat, India"
Any inconvenience caused is regretted.

COPYRIGHT FORM

Undertaking by Authors

We, the undersigned, give an undertaking to the following effect with regard to our article entitled"_____
_____ "
submitted for publication in Healthline journal :

1. The article mentioned above has not been published or submitted to or accepted for publication in any form, in any other journal.

2. We also vouchsafe that the authorship of this article will not be contested by anyone whose name(s) is/are not listed by us here.

3. I/We declare that I/We contributed significantly towards the research study i.e., (a) conception, design and/or analysis and interpretation of data and to (b) drafting the article or revising it critically for important intellectual content and on (c) final approval of the version to be published.

4. I/We hereby acknowledge the "Healthline" journal - conflict of interest policy requirement to carefully avoid direct and indirect conflicts of interest and, accordingly, hereby agree to promptly inform the editor or editor's designee of any business, commercial, or other proprietary support, relationships, or interests that I/We may have which relate directly or indirectly to the subject of the work.

5. I/We solemnly declare that the data pertaining to original articles, published in "Healthline" journal shall be provided, without restrictions, whenever asked for by the editorial board of the journal.

6. I/We also agree to the authorship of the article in the following sequence :-

Name of author	Signature with Date
1._____	_____
2._____	_____
3._____	_____
4._____	_____
5._____	_____
6._____	_____

Scanned copy of completed and duly signed declaration form should be emailed to the Editor/Publisher at **editorhealthline@gmail.com.**

2019-nCoV Outbreak

Recently, in Wuhan, China came into headlines for an outbreak of 2019 Novel Coronavirus (2019-nCoV). The virus causes respiratory illness. As per the initial investigations, the virus may have spread from animal to humans. The available genome sequences of the virus suggest a likely single, recent emergence from a virus related to bat coronaviruses and SARS-CoV. Coronavirus belongs to family coronaviridae. Corona viruses are enveloped virus with single stranded RNA genome. Only travel related cases have been reported (one each) in Thailand and Japan. The clinical signs and symptoms are mainly fever, cough and difficulty in breathing. Transmission occurs from person to person via respiratory droplets.

Travel Advisory to Travellers visiting China

Travellers to China should follow simple public health measures at all times as under:

- Observe good personal hygiene
- Practice frequent hand washing with soap
- Follow respiratory etiquettes - cover your mouth when coughing or sneezing
- Avoid close contact with people who are unwell or showing symptoms of illness, such as cough, runny nose etc.
- Avoid contact with live animals and consumption of raw/undercooked meats
- Avoid travel to farms, live animal markets or where animals are slaughtered
- Wear a mask if you have respiratory symptoms such as cough or runny nose

All travellers to China (in particular Wuhan city) to monitor their health closely

If the traveller feels sick and has fever and cough:

- Cover mouth while coughing or sneezing
- Don't plan travels if sick
- Seek medical attention promptly

If the traveller feels sick on flight, while traveling back to India:

- Inform the airlines crew about illness
- Seek mask from the airlines crew
- Avoid close contact with family members or fellow travelers
- Follow the directions of airline crew while disembarking

If the traveller feels sick on flight or at the time of disembarkation:

- Report to airport health authorities/immigration
- Follow the direction of the airport health officer

If the traveller feels sick with in a span of one month after return from China:

- Report the illness to the nearest health facility and also inform the treating doctor regarding the travel history

For Further Reading :

- About Novel Coronavirus (2019-nCoV) / CDR [Internet]. 2020 [cited 2020 Jan 25]. Available from: https://www.cdc.gov/coronavirus/2019-ncov/about/index.html.
- Novel Corona Virus / Ministry of Health and Family Welfare / GOI [Internet]. [cited 2020 Jan 25]. Available from : htttp://mohfw.gov.in/diseasealerts/novel-corona-virus

Call for Papers

Esteemed Reader,

"Healthline" journal is a peer reviewed official publication of Indian Association of Preventive and Social Medicine (IAPSM) managed by IAPSM- Gujarat Chapter. It is an indexed medical journal (with Index Copernicus, DOAJ, OPENJGATE, CABI, Index Medicus-SEAR) published biannually. The "Healthline" aims to promote quality research in the field of Community Medicine and Public health. The editorial board of the journal is committed to an unbiased, independent, and anonymous review of submitted articles.

Papers are invited from aspiring authors for the publication in the upcoming issue of "Healthline" journal. The authors may send the articles in the prescribed format (available in "instructions for authors" section). The articles are freely accessible on the official website of "Healthline" journal, which authors can download at any time. Besides original manuscript, journal also publishes Editorial (only by invite), Review articles, book review, letter to editor, short correspondence and any other important information/updates relevant to Community Medicine and Public Health.

You are requested to send your valuable manuscript or motivate your staff members, colleagues and PG students for publication in "Healthline" Journal.

For any further query or submission of the manuscript, kindly correspond with editorial team at **editorhealthline@gmail.com**. For further details, visit - **www.healthlinejounral.org**

Dr K N Sonaliya
Editor In Chief
Healthline Journal

The editorial board is highly obliged to the following reviewers for their kind co-operation in review of the manuscripts published in Volume 10 Issues 1 & 2 of "Healthline" Journal.

Dr K N Sonaliya
Editor In Chief
Healthline Journal

શાળા આરોગ્ય
રાષ્ટ્રીય બાળ સ્વાસ્થ્ય કાર્યક્રમ

દોઢ કરોડથી વધુ બાળકોના સ્વાસ્થ્યની સંભાળ

"શાળા આરોગ્ય સપ્તાહ" ના અભિગમથી

ધો. ૧ થી ૧૨ના પ્રાથમિક અને માધ્યમિક શાળાના બધા જ બાળકોની તપાસ

નવજાત શિશુથી છ વર્ષના આંગણવાડીમાં જતા બધા બાળકોની તપાસ

શાળા આરોગ્ય સપ્તાહ

સ્વચ્છતા | પોષણ | આરોગ્ય તપાસ | નિષ્ણાંત સેવાઓ | જન ભાગીદારી

"આપના દિકરા, દિકરી ની શાળા આરોગ્ય કાર્યક્રમ માં ચકાસણી થાય તેની કાળજિ લેવા સર્વ વાલીઓને વિનંતી"

આરોગ્ય અને પરિવાર કલ્યાણ વિભાગ, ગુજરાત રાજ્ય