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Impact of Lockdown on Other National Health Programs

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Coronavirus outbreak which started by the end of 2019 in Wuhan, an emerging business hub of China killed more than eighteen hundred and infected over seventy thousand individuals within the first fifty days of the epidemic. It turned into pandemic and affected major part of the world.^[1] Since 30th Jan, when the first case of covid-19 was reported in India, a total of 236,657 cases, 114,073 recoveries (including 1 migration) and 6,642 deaths have been reported by MOHFW till 6th June 2020.^[2] India was quick to close its international borders and enforced an immediate lockdown. Indian Prime Minister Mr Narendra Modi announced a 21 days lockdown on 24th March 2020 which was further extended. This lockdown was an attempt to prevent the community spread of corona virus in India. This was considered to be a vital step in stemming the spread of the virus and was appreciated by WHO as “tough and timely action”. Due to lockdown the government was able to buy time to prepare for a possible surge in cases but on the other hand health facilities in India were over stretched.

Rapidly increasing demand on health facilities and health care workers started putting strain on the health system of the country and enabled it to operate effectively. It is difficult for the health system of a developing country like India to keep pace with this increasing demand thus putting the country in a state of acute crisis of health care delivery system. The most unfortunate thing was that the direct cause of this crisis was not the SARS-CoV-2 virus.

During lockdown, various health indicators showed a worrying disruption in India's basic health services as local administrations focused on containing the spread of covid-19.^[3] Lockdown due to covid has done considerable harm to the physical and mental health of the people which may not be visible immediately but in longer run the data will depict the increase in various physical and mental trauma, the root of which will be traced back to the lockdown period.

Even as the lock down is ending - a new epidemic is now emerging. The stress of changed lifestyle during lock down in addition to social and economic

insecurity and the panic of becoming the victim of COVID-19 will add to the number of major and minor mental illness in the coming years.^[4] There will also be a risk of worsening of existing mental illness. Studies from China have started showing the results in this direction.⁵ A survey was conducted within seven days of start of lockdown by [Indian Psychiatry Society](#). The result of the survey reported a rise in 20% cases of mental illness in India. This upsurge of cases may be attributed to loss of employment leading to economic hardship, alcohol abuse, domestic violence and indebtedness. The lockdown will affect the mental health of people from all sections of the society but the catastrophe will be felt more by the poor, most vulnerable and marginalized groups.^[5]

Thousands of patients of various communicable and non communicable diseases may have missed potentially life-saving medical treatment during the lockdown period. NHM data shows that medical treatment of inpatients, outpatients, or emergencies decreased in both infectious and non-communicable diseases during this period of time. The patients of NCDs had limited access to OPD facilities. Comparing the data of lockdown with the previous year, it was seen that about 350,000 fewer people visited OPDs for the treatment for diabetes, 150,000 fewer people for mental illness and almost 100,000 fewer people for cancer treatment in the country.^[3] The existing epidemic of non-communicable diseases (NCDs) which is responsible for 72% of the deaths globally has been an aggravating factor for the adverse outcomes of the COVID-19. It has been seen that these patients often die of their original co-morbidities. Some of the risk factors for the NCDs which include unhealthy diet, stress, alcohol intake, and tobacco use are linked to COVID-19. Lockdown restricted the physical activity of people and this will further contribute to more NCDs in coming years. In a developing country like ours, Government has limited resources. In present scenario government is forced to divert health budgets to deal with COVID-19 pandemic, thereby most of the National programs like NCD programs will face shortage of resources to deal with the increasing disease burden.^[6]

A devastating effect of lockdown could also be felt on other national health programs. A modelling analysis commissioned by Stop TB partnership depicts disrupted TB diagnosis, treatment and preventive services during lockdown. This may take few more months to come on track even after the lockdown is over. Over next five years, 1.8 million cases of TB and 342,000 deaths may occur globally. India has the largest number of mortality due to tuberculosis in the world with more than 1200 people dying every day. As more TB patients find it difficult to get tested or access medicine during lockdown, this figure is almost certainly increasing every day. In India the number of TB notification has dropped by 80% during lockdown. The screening HIV/AIDS has also seen the down trend.^[7]

Though the MCH services continued during lockdown but the far reaching impact of lockdown on immunization services was also felt. By the time lockdown ends hundreds of children might already have missed their immunization doses This may be due to the difficulty in transportation, temporarily suspended vaccination sessions or the fear of catching COVID infection while visiting health centres. The NHM data showed that at least 100,000 children did not receive their BCG vaccination and another 200,000 missed one dose of the pentavalent vaccine. The public health physician of NGO Jan Swasthya Sahayog, Dr Yogesh Jain, estimates that around 15 lakh children might have missed vaccination.^[3] However, no official figure was available for the same. WHO has indicated that when immunization services are disrupted, the risk of vaccine preventable disease outbreak will increase. The effect of lockdown could be seen globally. More than 117 million children may be at risk of missing measles vaccination due to the COVID-19 pandemic. The American Red Cross, US Centers for Disease Control and Prevention (CDC), UNICEF, UN Foundation, and the World Health Organization (WHO) released a joint statement noting that over 117 million children may be at risk for missing out on receiving measles vaccines due to the COVID-19 pandemic.^[8]

ICDS and MCH services have also taken a backseat in India. More children will die of starvation and lack of healthcare than from the coronavirus infection. A sharp fall in medical interventions performed on pregnant women was also experienced. ASHAs were unable to perform their routine duties like immunization services of pregnant women and

family planning services as they were entrusted with many tasks pivoted around the pandemic control. Even shortages of vaccines which were scheduled to be given during pregnancy have been experienced.^[9]

At present we do not have reliable data to depict the true picture of disease burden during lockdown. NHM numbers do not show a spike in deaths or diseases. The fall in access to institutional health, including institutional deliveries, also indicates that official data on morbidity and mortality from hospitals will not give the full picture More people could be falling ill and even dying at home in this period. The past experience of Ebola outbreak in 2014-15, confirms higher mortality due to measles, malaria, HIV/AIDS, and tuberculosis than Ebola. The past may repeat itself and the consequences of missing the medication of tuberculosis or cancer will also be felt few months down the line. A serious public health crisis is already brewing, with the potential to erase gains made against a number of diseases over decades.

The list of diseases killing and disabling people is very long in India and ignoring them will put again many at risk of death. The possibility of how the coronavirus phenomenon is killing more people than the infection itself is worth considering.

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An Epidemiological Study on Hypertension and Its Determinants among Urban Slum Women of Rajkot City, Gujarat

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Abstract :

Introduction: The prevalence of hypertension ranges from 20% to 40% in urban adults and ranges from 12% to 17% in rural adults in India. In informal settlements like slums, NCDs are at particular risk of going undetected by formal health registries until presentation in a late stage of disease or death. NCDs among women have major health challenges. **Objectives:** To assess prevalence, determine factors responsible for Hypertension and study the treatment and control status of confirmed cases. **Methods:** This is a cross sectional study conducted among 405 slum women of age 35 years or more in Rajkot city. Interview, anthropometric measurements and Blood Pressure were measured for all participants. **Results:** Total 191(47.16%) women were diagnosed with hypertension. There was a statistically significant association between age groups, occupation, BMI, remaining busy in household work, walking, practicing healthy habits and hypertension. Out of all study participants, 75(39.26%) were aware of their hypertensive status. Out of those aware, 57(76.00%) were treated and out of those treated only 20(35.08%) were adequately treated. **Conclusions:** Studied population had poor awareness, poor treatment status and inadequate control of hypertension.

Key words: Control Status, Hypertension, Slum, Women

Introduction:

The epidemiological transition has shown the shift of diseases from communicable to non-communicable diseases, such as cardiovascular disease, hypertension, diabetes, cancer and obesity.^[1] Non-communicable diseases (NCDs) kill 40 million people each year, equivalent to 70% of all deaths globally. Each year, 15 million people die from a NCD between the ages of 30 and 69 years; over 80% of these "premature" deaths occur in low- and middle-income countries.^[2]

Worldwide, raised blood pressure is estimated to cause 7.5 million deaths, about 12.8% of the total of all deaths. This accounts for 57 million disability adjusted life years (DALYS) or 3.7% of total DALYS.^[3] The prevalence of hypertension ranges from 20% to 40% in urban adults and ranges from 12% to 17% in rural adults in India.

Despite the high prevalence; prevention, detection, treatment, and control of hypertension is

still suboptimal and unsatisfactory. Hypertension is usually essential or primary, silent and asymptomatic; making it one of the worst risk factor for a number of non-communicable diseases. Hypertension has silent and asymptomatic nature; therefore, adheres to 'rule of halves'.^[4]

Slums are characterized by urbanization, a lack of urban planning, overcrowding, and exclusion from social, health, and other services. In informal settlements, chronic non-communicable diseases are at particular risk of going undetected by formal health registries until presentation in a late stage of disease or death; this has been attributed to a lack of access to health services and inadequate or inappropriate care when services are sought.^[5] This pattern of health-seeking behaviour typically results in an undue human cost and financial burden on existing health systems, underscoring the need for non-communicable disease (NCD) data to advise health interventions targeting the urban poor.^[6]

NCDs are the leading cause of death for women worldwide. They cause 65% of all female deaths, amounting to 18 million deaths each year. In many low- and middle-income countries, the low socio-economic, legal and political status of girls and women is increasing their exposure and vulnerability to the risk factors of NCDs. Women living with NCDs experience specific challenges in accessing cost-effective prevention, early detection, diagnosis, treatment and care of NCDs, particularly in developing countries. Women slum dwellers are particularly vulnerable to negative health outcomes.^[7] Hence this study was carried out to assess the prevalence of selected non-communicable diseases and their determinants among urban slum women.

Methods:

This study was conducted in Rajkot city which is divided into 3 zones, central, east and west in which there are total 18 wards. Study was conducted during June 2016 to March 2017. Assuming 50% of slum women to be having hypertension, thus considering prevalence to be 50%, with 95% confidence interval and 10% allowable error, sample size of 400 was obtained with the formula of $N = 4pq/l2$. So it was decided to study 405 slum women covering 135 from each of the three zones.

The study was conducted in one slum area from each zone making a total of three slum areas. One slum area was randomly selected from each of the three zones from the list given by Corporation authority. After surveying the boundaries of the slum area, each slum area was divided into three subareas and 45 women from each of these subareas, making 135 from each slum, were included in the study. For each subarea, first household was selected randomly from the centre of that area. Nearest door to the first house was taken as second house till the desired sample for that area was achieved. An enquiry regarding an eligible participant was made and included as designated participant in the study.

Women of age 35 years or more were included in the study while pregnant women, women unable to give satisfactory interview and/or unfit for examination were excluded from the study.

Data collection:

Pre-tested and semi-structured questionnaire was used. The questionnaire was filled by personal interview in local language after taking written consent. Privacy was ensured and individual results were kept confidential.

Questionnaire included information regarding participant's socio-demographic profile like age, occupation, income and questions regarding risk factors. Anthropometric measurements (Height and weight) and clinical examination i.e. Blood Pressure measurement was also carried out.

Blood Pressure was recorded in sitting position in right arm to the nearest 2 mm Hg using mercury sphygmomanometer. Two readings were taken 5 minutes apart and the mean of two was taken as blood pressure. Variation in blood pressure measurements was minimized by ensuring 10 minutes rest before BP recording; using standard cuffs for adults fitted with standard mercury sphygmomanometer; placing the stethoscope bell lightly over the pulsatile brachial artery and the same observer recording the blood pressure. Height was measured in centimetres by non-stretchable measuring tape with 0.5 cm accuracy. Weight was recorded in kilograms on digital weighing machine (Omron). Throughout the study same weighing machine was used. BMI was calculated from the height and weight measurement. It is defined as the weight in kilograms divided by the square of the height in meters (kg/m^2). Modified Prasad classification was used to categorise participants from class I to V based on their socio-economic status. Hypertension was defined according to 8th report of Joint National Committee (JNC VIII).^[8] Accordingly, any individual who had systolic blood pressure (SBP) of 140 mm Hg or greater and/or diastolic blood pressure (DBP) of 90 mm Hg or greater or who reported to be known hypertensive was diagnosed as hypertensive. Awareness status was determined based on cases who were known hypertensive. The treatment status was defined as taking any pharmacological treatment for hypertension. Controlled hypertension was defined as those who were on treatment and had a BP of $<140/90$ mm Hg.

The data entry was done in Microsoft Office Excel 2007 and analysis was done by using Microsoft Office Excel 2007 and Epi info Software (Version 7.1.5.2) from CDC, Atlanta, U.S.A. Chi square test was used to know the association of Hypertension with various factors. Ethical clearance was taken from the Institutional Ethical Committee (IEC), P.D.U. Government Medical College, Rajkot to conduct the study.

Result:

It is evident from Table 1 that total 191 (47.16%) women were diagnosed with hypertension. 75 (18.52%) were known cases of hypertension and 116 (28.64%) women were newly detected with hypertension. According to stages of hypertension, 80 (19.75%) women were having stage 1 hypertension and 36 (8.89%) women were having

stage 2 hypertension. It is found that majority of women, i.e.112 (27.65%) were in pre-hypertension category followed by 102 (25.19%) women who were having normal blood pressure.

As evident from Table 3, out of all women, 191 (47.16%) were hypertensive and highest proportion of hypertension i.e. 112 (59.26%) was found in age group of 50 or more years and an increasing trend of hypertension with age was seen. Highest proportion of hypertension, 49 (62.82%) was found in retired women whereas lowest proportion, 99 (40.08%) was found in housewives. There was statistically high significant association between occupation and hypertension.

A very high proportion of hypertensive women, 126 (59.43%) were found in BMI category of 25 or more while 65 (33.68%) belonged to less than 25 BMI

Table 1: Distribution of participants according to their Blood Pressure measurement (N=405)

Category (BP in mm Hg)	Frequency	Percentage (%)
Normal Blood Pressure (≤ 120 AND ≤ 80)	102	25.19
Pre-hypertension (120-139 OR 80-89)	112	27.65
Known case	75	18.52
Stage 1 Hypertension (140-159 OR 90-99)	80	19.75
Stage 2 Hypertension (≥ 160 OR ≥ 100)	36	8.89
Total	405	100.00

Table 2: Descriptive statistics of various variables (N=405)

Variable	Mean	SD	Minimum	Maximum
Age (in years)	49	12.55	35	90
Systolic Blood Pressure (mm of Hg)	134	17.52	100	220
Diastolic Blood Pressure (mm of Hg)	86	8.18	68	140

Table 2 shows that mean age of study participants was 49 years Mean systolic blood pressure was 134 mm Hg while mean diastolic blood pressure was 86 mm Hg.

Table 3: Association of hypertension with various variables on applying chi square test

Particulars	Variables	Status of Hypertension				Test of significance
		Normotensive n (%)	Pre-hypertensive n (%)	Hypertensive n (%)	Total n (%)	
Age groups	35-50	68 (31.48)	69 (31.94)	79 (36.58)	216 (53.33)	$\chi^2 = 21.366$; df = 2; p = 0.000
	≥ 50	34 (17.99)	43 (22.75)	112 (59.26)	189 (46.67)	
	Total	102 (25.19)	112 (27.65)	191 (47.16)	405 (100.00)	
Occupation	Housewife	69 (27.94)	79 (31.98)	99 (40.08)	247 (60.99)	$\chi^2 = 15.508$; df = 4; p = 0.003
	Job/ Own business/ Labourer	21 (26.25)	16 (20.00)	43 (53.75)	80 (19.75)	
	Retired	12 (15.38)	17 (21.80)	49 (62.82)	78 (19.26)	
	Total	102 (25.19)	112 (27.65)	191 (47.16)	405 (100.00)	
Socio economic class	I/II	15 (23.08)	19 (29.23)	31 (47.69)	65 (16.05)	$\chi^2 = 1.043$; df = 4; p = 0.903
	III	37 (26.06)	42 (29.58)	63 (44.36)	142 (35.06)	
	IV/V	50 (25.25)	51 (25.76)	97 (48.99)	198 (48.89)	
	Total	102 (25.19)	112 (27.65)	191 (47.16)	405 (100.00)	
BMI	<25	70 (36.27)	58 (30.05)	65 (33.68)	193 (47.65)	$\chi^2 = 32.963$; df = 2; p = 0.000
	≥ 25	32 (15.09)	54 (25.48)	126 (59.43)	212 (52.35)	
	Total	102 (25.19)	112 (27.65)	191 (47.16)	405 (100.00)	
Remain busy in household work	Yes	81 (29.45)	76 (27.64)	118 (42.91)	275 (67.90)	$\chi^2 = 9.484$; df = 2; p = 0.009
	No	21 (16.15)	36 (27.69)	73 (56.16)	130 (32.10)	
	Total	102 (25.19)	112 (27.65)	191 (47.16)	405 (100.00)	
Walking (In kilometres)	≤ 1	71 (21.39)	92 (27.71)	169 (50.90)	332 (81.98)	$\chi^2 = 16.003$; df = 2; p = 0.000
	>1	31 (42.46)	20 (27.40)	22 (30.14)	73 (18.02)	
	Total	102 (25.19)	112 (27.65)	191 (47.16)	405 (100.00)	
Total sleep duration (In hours)	<6	6 (20.69)	10 (34.49)	13 (44.82)	29 (07.16)	$\chi^2 = 8.231$; df = 4; p = 0.083
	6-9	77 (29.50)	65 (24.90)	119 (45.60)	261 (64.44)	
	>9	19 (16.52)	37 (32.17)	59 (51.31)	115 (28.40)	
	Total	102 (25.19)	112 (27.65)	191 (47.16)	405 (100.00)	

category and the difference is statistically highly significant. Proportion of hypertension was maximum, 73 (56.16%) in women who did not remain busy in household work. The relationship between remaining busy in household work and hypertension is statistically highly significant. Among 332 (81.98%) who walked 1 kilometer or less, around half i.e. 169 (50.90%) were hypertensive. Statistically high significant association between walking and hypertension is found. A very high proportion of hypertension, 176 (48.48%) was found among women who were not practicing healthy habits, like, Exercise, Diet related practices like avoiding junk food, including fruits, vegetables, regular health checkups etc. There is statistically high significant association between practice of healthy habits and hypertension. There is no relationship between other variables like socio-economic class, total sleep duration and addiction with hypertension in this study.

Figure 1 shows that out of all study participants i.e. 405 women, 191 (47.16%) had hypertension. The prevalence of self-reported hypertension was 39.26% which means that 75 out of 191 women were aware of their hypertensive status and 116 (60.74%) were not aware of their status. Out of those aware, 57 (76.00%) were treated and out of those treated only 20 (35.08%) women were adequately treated.

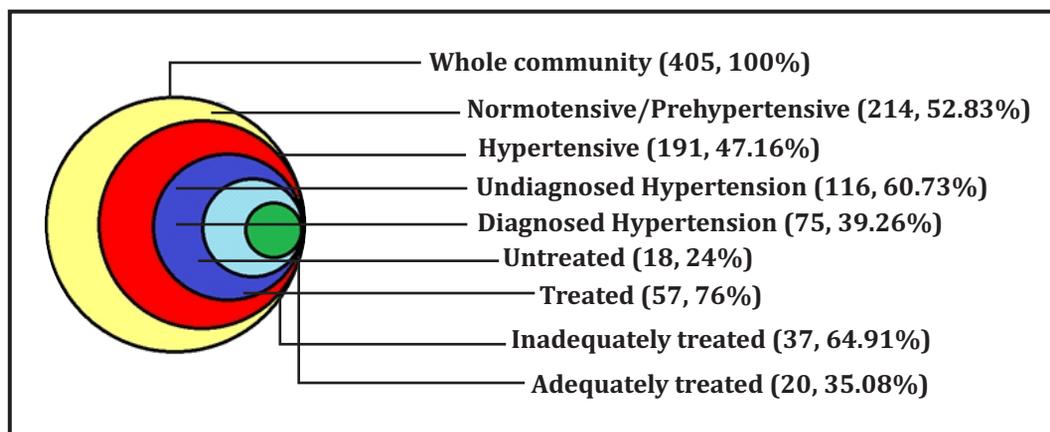
Discussion:

The present cross sectional study was conducted to know the prevalence and association between

Hypertension and various risk factors and to know the awareness, treatment and control status of known cases.

The present study reports prevalence of hypertension to be 47.16%. A study conducted by Tushar Acharyya (2010)^[9] in the Urban Slums of North 24 Parganas District, West Bengal among participants in age group 25-64 showed the overall prevalence of hypertension to be 34.2% which is lower than present study. The difference is likely to be due to higher age group of participants in current study. Similar findings as in present study were seen in a study conducted by Kanica Kaushal et al (2016)^[10] in an urban adult population of Himachal Pradesh in which out of total 400 participants, 208 (52%) had hypertension. Pawar AB et al (2010)^[11] in a study done among elderly women more than 60 years age in slums of Surat city showed total prevalence of hypertension to be 73.3% and the new case detection rate was found to be 38%. The prevalence is higher than present study due to higher age group of participants in this study. Raghupathy Anchala et al conducted a systematic review and meta-analysis (2013)^[12] among adults more than 18 years of age which showed overall prevalence of Hypertension in India to be 29.8%. Significant differences in prevalence were noted between rural and urban parts of India, 27.6% in rural and 33.8% in urban. Sanjeet Panesar et al (2013)^[13] showed age 40-49 years (P = 0.020) and 50-59 years (P = 0.012), clerical/professional occupation (P = 0.004),

Figure 1: Application of 'Rule of halves' in hypertension among study participants (N=405)



abnormal waist circumference (≥ 90 cm in males and ≥ 80 cm in females ($P = 0.001$), above-average daily salt intake ($P = 0.000$) were significantly associated with hypertension. Om Prakash Das et al (2014)^[14] found the prevalence of hypertension to be significantly associated with age, sex, family history and BMI. Siraj Ahmad (2015)^[15] conducted a study among adults in urban area of north India and found a significant association between age, socio-economic class, BMI, dietary excess salt, physical activity, self-perceived stress and hypertension.

The prevalence of self reported hypertension among diagnosed patients was 67% i.e. 139 were aware. Of these, 123 (88%) were under treatment for hypertension out of which 43 (35%) got adequately treated. These findings are supported by a similar study carried out in urban slum of Devangere, karnataka by VaradarajaRao BA et al (2014)^[16]. The overall prevalence of hypertension in this population was 36.7% i.e. 367 out of 1000 had hypertension. Of these 367 individuals, only 127 (34.6%) were known hypertensive. Of the 127, only 87 subjects (68.5%) were under any kind of antihypertensive therapy. Of these 87 individuals, only 21 (24.1%) had blood pressure under control. In another study conducted by Sanjeet Panesar et al (2013)^[17] the prevalence of hypertension was 17.4% out of which about 26 (48.1%) subjects were aware of their status. Only 21 (38.9%) were on treatment and among them only 10 (18.5%) subjects had their blood pressure controlled. A study done in urban population of south India by R Deepa et al (2003)^[18] showed the overall prevalence of hypertension to be 22.1% i.e. 279 out of 1262 had hypertension. Of these, only 104 (37.3%) were known hypertensive of which only 52 subjects (50%) were under any kind of antihypertensive therapy. Of them only 21 (40%) had blood pressure under control. Raghupathy Anchala et al^[12] showed the pooled estimate for awareness of BP in rural and urban India to be 25.1% and 41.9% respectively. The pooled estimate for the percentage of treated among those diagnosed with HTN in rural and urban areas to be 24.9% and 37.6% respectively and the pooled estimate for percentage of hypertensive patients having their BP under control in rural and urban India to be 10.7% and 20.2% respectively.

In the present study, measurement of Hypertension is done as per ACC/AHA (American College of Cardiology/ American Heart Association) guidelines in which average of two readings of Blood Pressure is taken. So, Hypertension prevalence in this study may be high when compared to other studies considering WHO guidelines for Hypertension measurement.

Conclusion:

The findings of present study contrasts with the earlier belief that hypertension is the disease of affluent. A high prevalence of Hypertension is found in women residing in slum areas. A significant association is found between hypertension and various factors have been found. The 'rule of halves,' when taken as a standard of measurement, showed that the study population had poor awareness; poor treatment status and inadequate control of hypertension. There is an urgent need to conduct similar researches in other cities and states to find the exact burden and treatment status of this silent disease so that required measures can be adopted.

Recommendation:

Regular screening programme with an objective of early identification of Hypertension among these women should be conducted. Health education and regular follow up of such cases can prevent disease development. Looking to poor treatment status among established cases, proactive community based case management system needs to be developed.

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Cross Sectional Study of Knowledge about MR (Measles Rubella) Campaign in Medical and Nursing Students Studying at Civil Hospital, Ahmedabad.

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Abstract:

Introduction : India is committed to goal of Measles elimination and Rubella control by 2020, for this purpose MR vaccination campaign has implemented. **Objective:** To assess awareness of MR Campaign in medical and nursing students of civil hospital, Ahmedabad. **Methods:** This cross sectional study was conducted on medical and nursing students of civil hospital, Ahmedabad, Gujarat. Baseline knowledge of MR campaign, side effects of MR vaccine, was assessed by a self-administered structured questionnaire. Data analysis was done in Microsoft excel and chi square test was applied. **Results:** There were 222 respondents and among them 120 (54%) were medical students and 102 (46%) were nursing students, with male female ratio of 95:127. Awareness regarding MR Vaccination Campaign found significantly more in nursing students as compare to medical students whereas Medical students had more knowledge about MR vaccine as compared to nursing students. **Conclusion:** There is still gap in awareness of MR vaccination campaign among medical students. Field visits among nursing students have positive effects on awareness of nursing students.

Key words : Knowledge, Medical students, MR campaign, Nursing students

Introduction :

The Measles and Rubella (MR) campaign is an ambitious public health initiative of the Govt. of India to eliminate Measles by 2020 and control Rubella/Congenital Rubella Syndrome (CRS). It targets children in a wide age group between 9 months and 15 years. This was largest ever Measles Rubella campaign launched all over the world.^[1] This campaign is a second opportunity for those children who were left out due to either vaccine failure or failure to vaccinate. High population immunity will then be sustained by follow-up campaigns and incorporation into routine immunization schedule at 9 months and 18–24 months. The MR vaccine has a robust safety and effectiveness profile. Under field conditions, seroconversion is 85% at 9 months and 95% at 12 months or more for Measles, and 95% at 9–12 months and more than 99% when given beyond 12 months for Rubella. Adverse reactions are generally mild and transient.^[1]

For the MR campaign to be effective, it is important that no child be left behind. The current

campaign is implemented through fixed sites sessions in schools and outreach centers.^[1] Therefore, the teachers are relied on to convey the importance of vaccination. Vaccine hesitancy refers to delay in acceptance or refusal of vaccination despite availability of vaccination services^[4] and it is critical to understand this period of indecision. In India, resistance to vaccination was due to ignorance in the past^[2,3], though currently, the campaign on social media such as Whats App fuels a mix of conspiracy theories, safety concerns, and questions the need for the MR campaign.^[5] Studies show that the messages are inconsistent and negative. This means that knowledge of medical and para-medical fraternity should be complete so that, they could pass the same message to the community. This study is done with the purpose of assessing the knowledge among the upcoming new generation of medical and para-medical fields.

Objectives:

1. To assess the awareness about MR Campaign among medical and nursing students.

2. To evaluate the knowledge about Measles and Rubella vaccine among the study participants.

Method:

A cross sectional study was conducted during August 2018 to October 2018. The study was carried out at medical college and nursing school which were located civil hospital campus of Ahmedabad. Total, 222 students (Third Year Part-1 Medical students =120 and Third Year B.Sc. Nursing students =102),(Male= 127, Female = 95) aged approximately 20-21years were included in the study by purposive sampling. Every student of the batch was included in study except those who were absent at the time of study. Those who didn't give informed consent were also not included in study. Data was collected by using structured questionnaire. The questionnaire included questions for assessing the knowledge regarding Measles-Rubella vaccination campaign, knowledge regarding Measles -Rubella vaccine and usefulness of this campaign. Positive results (YES) regarding awareness were they do know about MR campaign held in Gujarat from 16/7/2018 with the session site at school, anganwadi and outreach station, for children of 9 months to 15 years of age. Positive results (YES) regarding MR vaccine were they do know that live attenuated MR vaccine was given by sub-cutaneous route at right shoulder with 0.05 ml dose. Positive results (YES) regarding usefulness of the campaign were they do believe that this campaign would be helpful to eliminate Measles by 2020 and control Rubella/Congenital Rubella Syndrome (CRS).Positive results (YES) regarding

combination of the vaccines were they do believe that both the vaccines used by this single campaign is excellent way to tackle both the disease at a time. The results were expressed in percentages represented by tables and Analysis was done by M.S. Excel 2007. Permission to carry out the research was obtained from Nursing school and Medical college authorities. As this study doesn't include active intervention, ethical permission wasn't required. Students were enrolled after obtaining informed consent and participation was purely voluntary and they were also assured that the study will not have any detrimental effect on the participant.

Results:

Table 1 shows awareness regarding campaign, which was 91.8% among medical students and 84.3% among nursing students. This difference was not statistically significant.

Only 32% medical students were aware of duration in which this campaign was ongoing while surprisingly 84.3% nursing students, were aware about campaign duration. This difference was statistically significant.(chi square = 63.4 with p value < 0.05) MR Vaccination was supposed to be given to eligible children (9 months to 15 years) at various sites like in the school, anganwadi and out-reach station. Knowledge about age group included in campaign was known to 56.6% medical students and 85.3% nursing students, This difference was statistically significant.(chi square = 63.4 with p value < 0.05) Nearly 41% medical students and 65.7% nursing students had awareness regarding session

Table 1: Awareness regarding MR Vaccination campaign

Awareness	Medical (N = 120)		Nursing (N = 102)		χ^2	p value
	YES (%)	NO (%)	YES (%)	NO (%)		
Campaign	112(91.8)	10(8.2)	86(84.3)	16(14.7)	2.45	> 0.05
Duration	38(32)	82(68)	86(84.3)	16(14.7)	63.4	< 0.05
Age - group	68(56.6)	52(43.4)	87(85.3)	15(14.7)	21.69	< 0.05
Session site	50(41)	70(59)	67(65.7)	35(34.5)	13.58	< 0.05

Table 2: Awareness regarding MR Vaccine

MR Vaccine	Medical (N = 120)		Nursing (N = 102)		χ^2	p value
	YES (%)	NO (%)	YES (%)	NO (%)		
Type	84(68.9)	36(31.1)	92(90.2)	10(9.8)	15.03	< 0.05
Dose	73(59.8)	47(40.2)	92(90.2)	10(9.8)	26.39	< 0.05
Route	91(74.5)	29(25.5)	70(68.6)	32(31.4)	0.97	> 0.05
Site	90(73.8)	30(26.2)	77(75.5)	25(24.5)	0.086	> 0.05

Table 3: Awareness regarding usefulness MR Vaccination campaign

Usefulness	Medical (N = 120)		Nursing (N = 102)		χ^2	p value
	YES (%)	NO (%)	YES (%)	NO (%)		
Campaign	50(41.8)	70(58.2)	82(80.4)	20(19.6)	34.29	< 0.05
Combination of Vaccine	12(11.5)	108(88.5)	37(36.3)	65(63.7)	19.42	< 0.05

site of the campaign, This difference was statistically significant.(chi square = 13.58 with p value < 0.05)

The live attenuated strain of vaccine with the dose 0.05ml and site at right shoulder by subcutaneous route used during the campaign. This knowledge was varying from 59.8% to 74.5% among medical students and from 25.5% to 40.2% among nursing students.(Table 2)

Table 3 shows that ,41.8% medical students and 80.4% nursing students were aware about usefulness of campaign. This difference was statistically significant (chi square = 34.29 with p value < 0.05). Only 11.5% medical students and 36.3 % nursing students, were aware about usefulness of vaccine combination. This difference was statistically significant (chi square = 19.42 with p value < 0.05).

Discussion:

In India, 49200 children Under 5 years of age died in 2015, most of them were not vaccinated by Measles vaccine. To combat this situation, India has

committed the goal of Measles elimination and control of Rubella by 2020. The first phase of the MR vaccination campaign was launched in the states of Tamil Nadu, Karnataka, Goa and; in Puducherry and Lakshwadeep.^[1] According to estimates, Tamil Nadu recorded the lowest coverage at 54%.^[2] In Gujarat, this campaign was implemented on July 2018.^[1]

In Present study awareness regarding campaign was higher (91.8%) among medical students as compared to nursing students (84.3%). In study by Mrs. Kirandeep Kaur et al, 53.3% of her study participants had moderately adequate knowledge about the campaign.^[7] A knowledge assessed in an Egyptian University revealed that their students were generally poorly informed about both vaccine adverse effects, and contraindications although medical students tended to be better informed than other students.^[8] For the MR campaign to be effective, it is important that no child be left behind. The current campaign is implemented through fixed sites sessions in schools and outreach centers.^[1] Therefore,

the teachers are relied on to convey the importance of vaccination.^[7] Another study conducted by A Sreedevi et al shows similar results of vaccine hesitancy like this study^[6].

MR Campaign is a part of global efforts to reduce illness and deaths due to Measles and Rubella/CRS in the country. Measles immunization directly contributes to the reduction of under-five child mortality, and in combination with Rubella vaccine, it will control Rubella and CRS. The aim of giving combination of vaccines during the campaign, was to prevent both the diseases by single session.^[7]

Conclusion:

MR Vaccination campaign may have been more successful with better use of health education message especially in medical and para-medical personnel, As they are the bridge population between public and professional health team.

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Study of Self-Reported Morbidity Profile among the Rural Tribal Population in a District of Western India

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Abstract :

Introduction: India has a dual burden of both communicable as well as non-communicable disease. The morbidity pattern of a population is considered as a proxy measure to understand the country's health status. **Objectives:** - To study the demographic profile villages & compare it with national level. - To assess the common morbidity pattern, its age-wise distribution and proportion of multi-morbidity in the community. **Methods:** The present cross-sectional study was a part of routine RHTC work. For present study, 5 out of 15 villages under the Primary Health Centre (PHC) Bahadarpur were included with purposive sampling. House to house visit was done. Data was collected by trained intern doctors posted at RHTC from November 2014 to January 2015. All villagers who were living in those villages for more than a year and fitting in the definition of a family were included in the study. **Results:** Oro-dental diseases, ophthalmic diseases, musculoskeletal diseases & non-communicable diseases were top in prevalence list. Prevalence of multi-morbidity for non-communicable diseases was 14.68%. In children below the age of five years most common morbidity was acute respiratory infection, Among children aged between 5 years to 14 years most common morbidity was ophthalmic disease while among 15-60 years of age group & in geriatric population oro-dental disease was most common morbidity. **Conclusion:** The present study gave prevalence list for various diseases. Acute respiratory infections are still major problem among children. Multimorbidity is a new phenomenon which was observed in rural tribal villages. Such community-based prevalence of different diseases will help to understand the changing disease pattern in the community.

Key Words : Disease Pattern, Disease Burden, Epidemiologic Transition, Morbidity, Multi morbidity, Non-Communicable Diseases (NCDs)

Introduction :

According to the World Health Organization's Global Burden of Disease (GBD) study in 2017, infectious disease and maternal, neonatal & nutritional factors accounted for more than 10.3 million deaths worldwide (18.6%) out of a total 55.9 million. Non-communicable diseases, on the other hand, caused 41 million or 73.4% of deaths worldwide.^[1] Given such mortality evolution, most developing countries are exhibiting a drastic change in their disease pattern with an increase in non-communicable deaths.^[2] Modernization, improved sanitation and better housing conditions in

developing countries have been compelling in controlling infectious diseases.^[3] Omran in 1971 termed these changes a 'transition of epidemiology', whereby infectious diseases are being replaced by chronic diseases over time due to expanded public health care and sanitation.^[4]

Although the transition of the disease pattern from acute communicable to chronic non-communicable disease is widely visible on the world map, there is substantial variation in the levels and patterns of mortality crosswise over nations and locales. These distinctions reflect disparities in the accessibility of fundamental necessities like food, safe

drinking water, sanitation, housing and health care. They also reflect differences in risk factors, behavioural choices, demographic characteristics and other societal contexts that influence the survival of individuals.^[5,6]

India has a dual burden of both communicable as well as non-communicable disease. Although CVDs and other non-communicable diseases are on the ascent, communicable diseases continue to be a noteworthy public health problem in India. Study of health transitions in India reveals a decrease in general mortality at a national level as well as state-level over the last three decades; however, the present status of bleakness in India is yet to be evaluated. India had 33% of the total Disability-Adjusted Life Year (DALY) from infectious disease and maternal, neonatal & nutritional factors (CMNNDs), 55% from Non-communicable diseases (NCDs), and 12% from injuries in 2016.^[7] Life expectancy at birth for males and females will increase by 10 years and 11 years respectively from 2006– 2051 as per “Morbidity and health care” schedule of NSSO 60th round survey and the proportion of elderly are expected to increase at a rapid pace than younger population because of slow or decline growth rate.^[8] These demographic changes will influence the morbidity pattern & proportion in the country.

The morbidity pattern of a population is considered as a proxy measure to understand their health status. Measures of self-reported morbidity are directly linked to the health status of any given population. Recently research has been done to assess the pattern of morbidity across the major states in India using nationally representative large-scale survey data, but there is limited research on morbidity pattern for a rural tribal area of India.^[1,7] With this view keeping in mind, the present study was conducted to assess the demographic profile, common morbidity pattern & its age-wise distribution and proportion of multi morbidity in rural tribal population of Gujarat.

Methods:

The present cross-sectional study was a part of a routine RHTC (Rural health Training Centre) activity

of the Department of Community Medicine. As a part of this activity, 5 out of 15 villages under the Primary Health Centre (PHC) Bahadarpur were included in the study by purposive sampling. Following five villages of Tribal rural district Chhotaudepur of Gujarat: Bahadarpur, Golagamdi with vasahat, Kherva, Rughnathpur and NaniAkhtyarpur were included in the study. The geographical area map was collected from Gram panchayat and all families living in this panchayat area were the study participants. Details of family and family members were obtained. The study was started after getting permission of the institutional ethics committee. House to house visit was done and Data was collected by trained intern doctors posted at RHTC from November 2014 to January 2015. Informed consent was taken prior to data collection. Interns gathered Information in pilot pre-tested proforma. The inclusion criteria for the study were all villagers living in a village for more than a year and fitting in the definition of family. The visitors were not included in study participants. The information was collected from either head of the family or key person of the family.

The key information regarding socio-demographic and morbidity variables were collected in a structured and coded questionnaire. Morbidity data were collected from the respondent by asking System wise disease to avoid recall bias & then positive history was cross-verified by history, investigation and clinical records wherever it was available. Cataract, glaucoma, refractive error, blindness etc. diseases were covered under ophthalmic diseases. Back pain, carpal tunnel syndrome, epicondylitis, tendinitis etc. diseases were covered under musculoskeletal diseases. Same way system wise diseases were merged into the major group diseases. Those households, which were closed on 3 consecutive visits each 1 week apart, were excluded from the present study considering permanent migration. The investigators did back check for validation of data. Collected data were compiled in Microsoft office Excel 2007 format. Data were processed using Epi info statistical software 7.2. Descriptive and analytical statistical methods were used for the data analysis.

Results:

In the present study, 1324 families with 6157 total population were studied. Out of which 23.8% were below 14 years, 64% were between 15 to 59 years & 12.2% were above the age of 60 years. Sex ratio was 896 female / 1000 male, while child sex ratio was 1016 female / 1000 male. Their socio-economic status as class I, II, III, IV & V was 11.5%, 16.2%, 22.8%, 29% & 20.3% respectively. (Table 1)

Figure 1 shows the population pyramid of the survey population. The highest number of population was in 15-19 years of age group followed by 10-14 years of age group.

Prevalence of some commonly self-reported diseases were hypertension (4.58%), Diabetes mellitus (1.72%), Cardiovascular diseases (1.61%), Stroke (0.42%), cancer (0.15%), gastrointestinal disease (3.25%), ophthalmic disease (7.63%), Oro-dental disease (16.86%), Muscular skeletal disease (5.67%). (Table 2)

However, if only the adult population took for consideration, the age-standardized prevalence of hypertension was 6.81%, diabetes was 2.56%, cardiovascular disease was 2.39% & stroke was 0.62%.

Oro-dental diseases had the highest proportion of all morbidity among the community (30.63%) followed by Non-communicable diseases (17.47%), Ocular morbidity (13.87%), Musculoskeletal disorders (10.3%), Gastrointestinal disease (5.9%), Central nervous system disorder (4.95%). (Figure 2)

GI – Gastro Intestinal, CNS – Central Nervous system

Coexistence of two non-communicable diseases morbidity was found in 12.83% people while three or more morbidity was found in 1.85% of people. So, the prevalence of non-communicable multimorbidity (at least 2 morbidities) was 14.68%. (Table 3)

Figure 3 shows that in children below the age of five years, most common morbidity was Acute respiratory infection (46.67%) followed by Gastrointestinal tract disease (31.85%). Among children aged between 5 years to 14 years, most common morbidity was Ophthalmic disease

(56.83%) followed by Acute respiratory infection (19.56%). Among 15-60 years of age group, Oro-dental diseases were the most common morbidity (42.22%) followed by non-communicable diseases (15.76%). In the geriatric population with age above 60 years, Oro-dental diseases were the most common morbidity (32.78%) followed by non-communicable diseases (22.99%).

Discussion:

In the present study sex ratio was 896/1000 which is near to Gujarat sex ratio of 919. However, it was observed that child sex ratio (0-6 years) 1016/1000 which is female favourable and in contrast to Gujarat child sex ratio of 890.^[9] The probable reason behind female favourable sex ratio is tribal rural population.

In the present study, the highest number of population was in 15-19 years age group followed by in 10-14 years & in 5-9 years age group. These findings are in contrast with National level where the highest population is in 10-14 years, followed by in 5-9 years & in 15-19 years age group. The present study finding shows that the population pyramid is in the transition phase of changing from a typical developing country to a developed country.^[10]

In the present study, oro-dental diseases were most common among the community followed by Non-communicable diseases, Ocular morbidity, Musculoskeletal disorders, Gastrointestinal diseases and Central nervous system disorders respectively. Present study results were, in contrast, to study done in urban Tripura by Datta A et al where most common morbidity was Acute respiratory infection (ARI) followed by Musculoskeletal disease, anaemia & non-communicable disease respectively.^[11] Present study results were also, in contrast, to study done in rural Tamilnadu by Gopalakrishnan S. et al where most common morbidity was Respiratory diseases followed by musculoskeletal and digestive tract disease.^[12] The higher proportion of oro-dental morbidity in the present study might be because of a lack of awareness about dental problems & poor dental hygiene. Also, the higher proportion of non-communicable diseases & lesser acute respiratory tract infection diseases in the present study shows signs of epidemic transition which currently whole

Table 1: Socio demographic variables of the study population (n= 6157)

Demography	Characteristic	Frequency (%)	National average
Age (Years)	0-14	1465 (23.80%)	29.5%
	15-59	3941 (64.00%)	62.5%
	>60	751 (12.20%)	8%
	Total	6157 (100%)	100%
Sex	Male	3246 (52.72 %)	51.5%
	Female	2911 (47.28 %)	48.5%
	Sex Ratio	896/1000	896/1000 [#]
	Child Sex Ratio (0-6 years)	1016/1000	919/1000

* - As per census 2011 data^[17]

- As per SRS report 2017^[18]

Figure 1: Age pyramid of population(n = 6157)

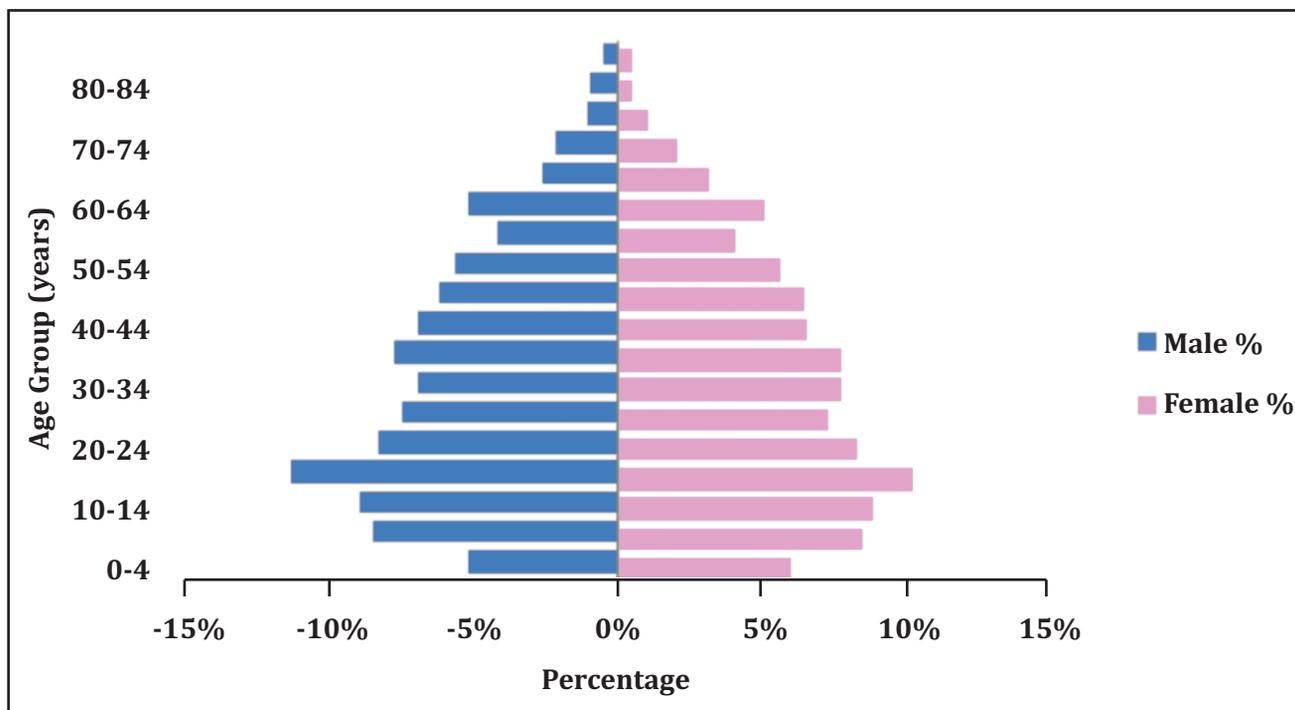


Table 2: Prevalence of common self- reported diseases (n = 6157)

Sr. No.	Disease	Number (n)	Prevalence (%)
1.	Hypertension	282	4.58
2.	Diabetes Mellitus	106	1.72
3.	Cardio vascular Disease	99	1.61
4.	Stroke	26	0.42
5.	Cancer	9	0.15
6.	Gastro Intestinal Disease	200	3.25
7.	Central Nervous Disease	134	2.18
8.	Ophthalmic Disease	470	7.63
9.	Respiratory Disease	125	2.03
10.	Oral dental disease	1038	16.86
11.	Muscular skeletal Disease	349	5.67
12.	Accident	30	0.49

Figure 2: Proportion of self- reported Disease burden in the community(n = 2868)

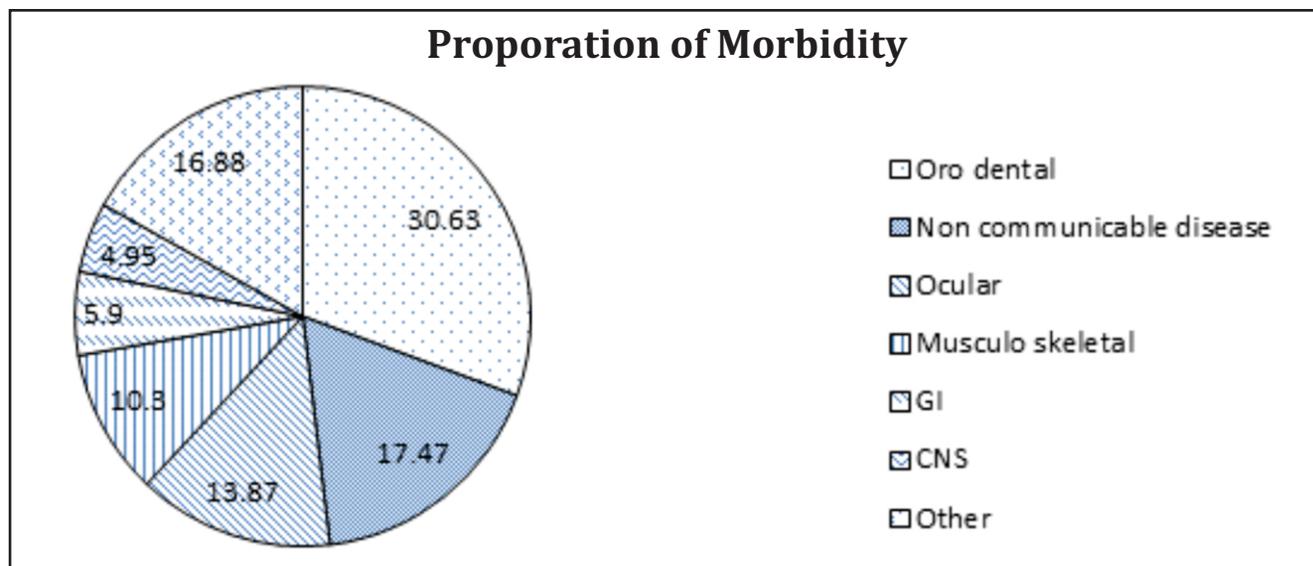
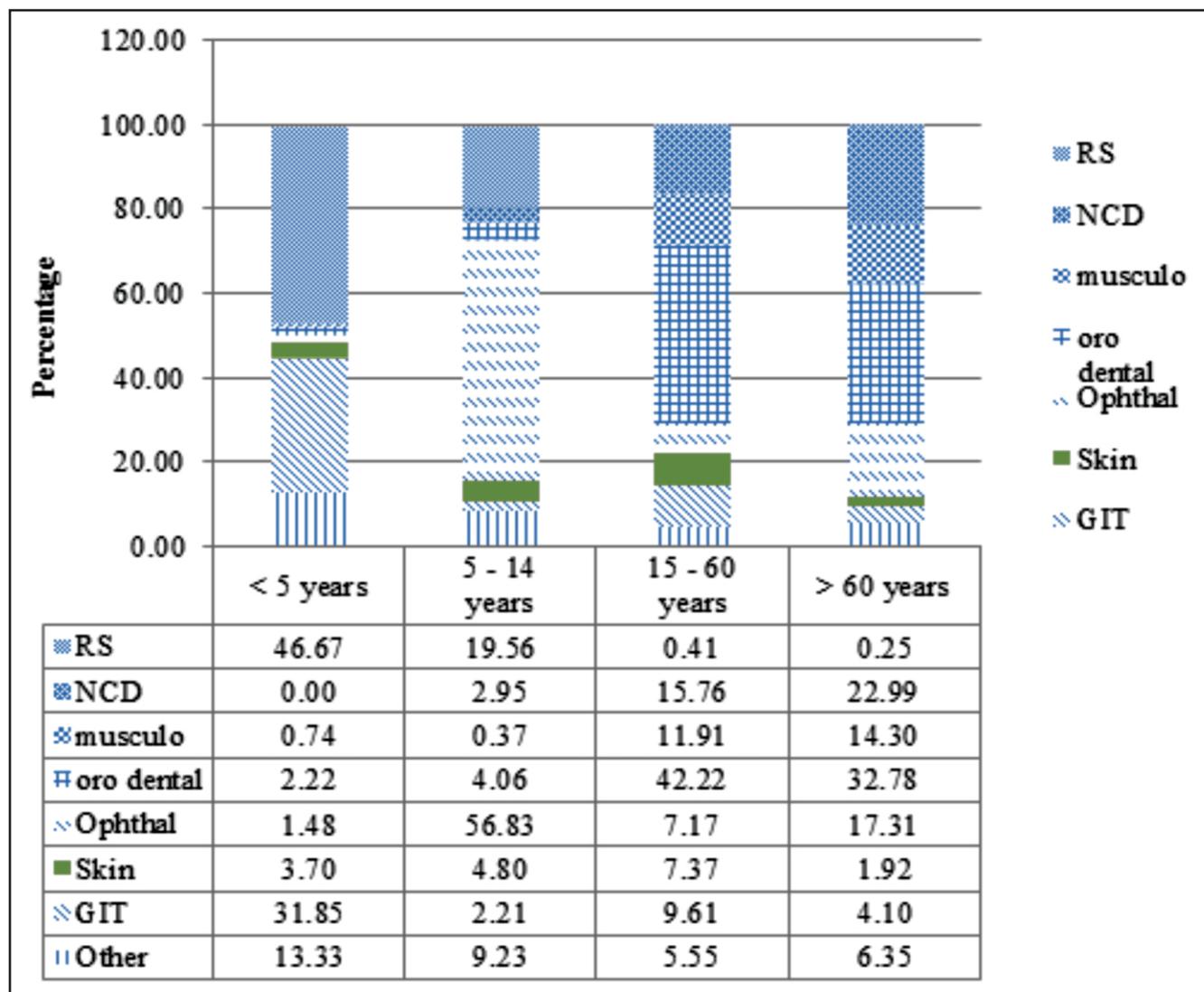


Table 3: Distribution of study population based on Multi morbidity of Non-Communicable disease per person (n = 592)

Sr. No.	Number of coexisting Non Communicable disease Morbidity per person	Frequency (%)
1.	Two	76 (12.83 %)
2.	Three or More	11 (1.85 %)

Figure 3: Age group wise distribution of common self- reported morbidities(n = 2868)



nation is facing with a dual burden of communicable & non-communicable diseases.

In the present study, Prevalence of hypertension was 4.58% & Diabetes mellitus was 1.72%. However, the age-standardized prevalence of hypertension was 6.81% & diabetes was 2.56% for the adult population. The Present findings were similar to the study done by A Bhansali et al who found the self-reported prevalence of hypertension at 5.5%.^[13] Although various meta-analysis & systematic review predicted prevalence of hypertension in India to be 25% (ranged from 13.9 to 46.3%) in urban and 10% (ranged from 4.5 to 58.8%,) in rural areas^[14,15], which shows that still there might be many hidden undiagnosed cases of hypertension in the community. In the present study high prevalence for oro-dental

diseases (16.86%), ophthalmic diseases (7.63%) & musculoskeletal diseases (5.67%) was found. The Present findings were matching with a study done by Gopalakrishnan S. et al.^[12] (Table: 2)

In the present study, the coexistence of two non-communicable diseases was found in 12.83% people while three or more was found in 1.85% of people. Multi morbidity (At least 2 morbidities) was found in 14.68% population. Present study findings were in contrast to the study done in rural Odisha by Banjare P. et al. who found multi morbidity prevalence as high as 56.8%.^[16] These difference might be because the current study was community-based and due to different geographical area of both the studies.

In the present study, most common morbidity in children below 5 years, children aged between 5

years to 14 years, 15-60 years of age group and age above 60 years were Acute respiratory infection, Ophthalmic disease, oro-dental disease and oro-dental disease respectively. It indicates that under 5 children were more vulnerable to acute respiratory infection while the refractory error like ophthalmic diseases were more common in children between 5 to 14 years. Oro-dental diseases were more common in adult as well as the geriatric population followed by Non-communicable diseases. Present findings were in contrast to the findings of Gopalakrishnan S. et al. study in which most common morbidities were respiratory, respiratory, musculoskeletal and musculoskeletal in below 5, 5-14, 15-60 and above 60 years of age group respectively.^[12]

Limitation:

As the current study objective is to cover all the morbidities, only current morbidity information was collected with a self-reported method. There was no diagnosis done by a team of an investigator.

Conclusion:

The present study shows the health status of the community by doing community diagnosis of disease load. Respiratory and gastrointestinal problems are still prevalent among children while non-communicable diseases are increasing among the adult population. Such community-based prevalence of different diseases helps to understand the changing disease pattern in the community. This study can set a background for establishing and strengthening outreach services like medical camps and the provision of specialist services to the catchment population.

Declaration:

Funding: Nil

Conflict of interests: Nil

Reference:

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Assessment of Growth Monitoring Activities under Integrated Child Development Programme (ICDS) in Vadodara District of Gujarat State

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Abstract :

Introduction: The Integrated Child Development Services (ICDS) programme is implemented through a network of community-level Anganwadi centers (AWCs). The range of services includes growth monitoring, immunization, health check-ups, and supplementary feeding, nutrition and health education. The study was done with the objective to assess the knowledge and skill of Anganwadi workers (AWWs) regarding growth monitoring at AWCs under ICDS. **Method:** It was a cross-sectional study conducted in 63 AWCs under field practice area of Rural Health Training Centre (RHTC) of the medical college. Knowledge and skill about growth monitoring were assessed by Knowledge Assessment Score (KAS) and Skill Assessment Score (SAS) respectively. **Results:** Mean KAS was 10.4 out of 15 whereas Mean SAS found to be 8.32 out of 10. Knowledge of AWWs regarding various topics like sources for getting birth date of child, procedure for weighing child, malnutrition grade by growth chart plotting and interpretation of various malnutrition grades was poor. Whereas understanding of various aspect of growth monitoring like when to start growth monitoring, how to weigh a child, interpretation of growth curve was good. **Conclusion:** Knowledge and skill regarding growth monitoring was lacking among AWWs. Training should be organized with continuous supportive supervision so that knowledge can be converted into skilful practices.

Key Words : Growth Monitoring, Anganwadi Workers, ICDS

Introduction :

India is home to 158.7 million children in the age group of 0-6 years. With nearly 20 per cent of the 0-4 years' child population of the world, India is home to the largest number of children in the world]. The Integrated Child Development Services (ICDS) represents one of the world's largest and most unique programme for early childhood development.

The programme is implemented through a network of community-level Anganwadi centres (AWC). The range of services targeted at young children and their mothers include growth monitoring, immunization, health check-ups, and supplementary feeding, as well as nutrition and health education to improve the childcare and feeding practices that mothers adopt. Preschool education is provided to children between three and six years of age].

Growth Monitoring and Promotion (GMP) is integral part of ICDS and widely used as a community-based tool for child survival. The use of growth monitoring extends beyond problem detection; it has been used to provide a basis for communicating with mothers on child health and nutrition by stimulating the thinking about the causes of poor growth and malnutrition.

The impact of any program is dependent on coverage, intensity of contact, frontline worker performance, and adequacy of resources. Training, supervision and support for workers must be improved if they are to be effective counsellors in growth promotion programme. The present study was conducted to assess knowledge and skill of anganwadi workers (AWW) regarding growth monitoring activities at AWC.

Methods:

A cross sectional study was conducted to assess the knowledge and skill of AWWs regarding growth monitoring activities under ICDS.

Sampling method: Two PHCs of Vadodara district under field practice area of Rural Health Training Centre (RHTC) of Medical College were selected purposively for the study. List of AWCs was procured from Chief Development Project Officer (CDPO). There were total 63 AWCs under these two PHCs. All AWWs of 63 AWCs who gave the consent to take part in the study were included.

Data Collection: Data collection was divided into three parts; basic information of AWW, knowledge assessment and skill assessment. Basic information of AWWs included their age, education, experience and details of training received.

The knowledge component of AWWs was assessed using a pre-designed, self-administered, standardized, 15 multiple choice questionnaires in local language, covering steps of growth monitoring. Each correct answer was given one mark. The score was counted out of total 15 marks considered as Knowledge Assessment Score (KAS) for each AWW.

For skill assessment, data of children between 6 months to 5 years who were weighed and plotted on growth chart in previous month by AWW were collected. Ten children's data were collected from each AWC using simple random sampling method. List of children were taken from AWW and random number were generated using random number generator mobile application. The data included information on birth date, age, sex, weight and malnutrition classification given by AWW. The collected data was crosschecked for malnutrition classification. Correct classification was decided using Weight for Age Z score calculated using WHO Anthro software. Out of 10 children from each AWC, each correct classification given by AWW was taken as 1 score. Total correct classification given by AWW out of 10 was considered as Skill Assessment Score (SAS). KAS and SAS was calculated for the first time in the study.

According to Weight for Age Z score, grade of malnutrition was determined as Red classification if Z-score is less than -3 SD, greater than or equal to -3 SD and less than -2 SD means yellow classification, greater than or equal to -2 SD means green classification. Here, red classification suggests severe malnutrition, yellow classification suggests moderate malnutrition and green classification suggests normal nutrition status or no malnutrition.

Approval of the ethical committee: Necessary permission from ICDS Department and ethical clearance from Institutional Ethics Committee for Human Research was taken prior to data collection.

Statistical Analysis: Data were presented in terms of proportions and percentages. Data were compiled and tables were made using Microsoft Excel. Analysis was done using Medcalc software. Weight for Age Z score was calculated by WHO Anthro software.

Results:

All 63 AWWs from selected 2 PHC areas gave the consent to take part in the study and data was collected from all of them.

Profile of the AWWs: The minimum age of AWWs was 22 years and maximum age was 57 years, the mean age being 41 years. Out of 63, 4 (6.4%) AWWs were educated up to primary education, 52 (82.5%) were educated up to secondary while 6 (9.5%) were graduates and 1 (1.6%) was post graduate. Regarding job experience as an AWW, 15 (23.8%) AWWs had less than 5 years, 4 (6.4%) AWWs had 5 to 10 years' experience and 44 (69.8%) AWWs were having experience of more than 10 years. Most of the AWWs (95 %) had received their induction training. Fifty-two AWWs (82.5%) had received refresher training while 11 AWWs (17.5%) did not get the refresher training. Education, experience and training status details were asked verbally only.

Knowledge assessment of AWWs: For knowledge assessment 15 multiple choice questions were given to AWWs in local language. Each correct answer was given one mark. The score was counted out of total 15 marks (Table-1). This score was considered as Knowledge Assessment Score for each AWW. Mean KAS of AWWs was 10.4+2.4 out of 15.

Table 1: Knowledge regarding steps of growth monitoring among AWWs

Question	Response	Number of AWWs gave Correct responses out of 63 AWWs
If, birthdate is not known, how will you get it?	a. From Mamta card b. From birth certificate c. From local calendar d. All of the above	25 (39.7%)
What is true about weighing?	a. Free suspension of scale b. At the level of eye c. Adjusted to zero before weighing d. Weighing with minimum clothing e. All of the above	40 (63.5%)
To measure accurate weight, how many times weighing should done?	a. Once b. Twice c. Thrice d. Don't know	36 (57.1%)
If child's weight/age falls on junction of yellow and red band, what does that mean?	a. Child is normal b. Child is moderately underweight c. Child is severely underweight	37 (58.7%)
What does flattened growth curve on growth chart signify?	a. weight is increasing gradually b. weight is low for age c. don't know	29 (46.0 %)
If the growth curve of a child is moving downward, it is	a. Good b. Dangerous c. Not significant	20 (31.7%)
If the growth curve of the child is moving downward, what should be done?	a. Nutritional counselling of mother b. Referral to health facility c. Regular follow up d. All of the above	39 (61.9%)

Table 2: Difference in Malnutrition grade given by AWWs and Weight for Age Z score (by WHO Anthro)

Malnutrition Grade	RED	YELLOW	GREEN	Total
AWW's Grade	61(9.7%)	282(44.8%)	287(45.5%)	630
Weight for Age Z score Grade by WHO Anthro	107(17%)	252(40%)	271(43%)	630

Table 3: Number and Type of Incorrect classification by AWWs

Incorrectly Upgraded	Number (out of 630)	Incorrectly Downgraded	Number (out of 630)
RED → YELLOW	47 (7.4 %)	GREEN → YELLOW	18 (2.8 %)
YELLOW → GREEN	32 (5.1 %)	YELLOW → RED	04 (0.6 %)
RED → GREEN	03 (0.5 %)	GREEN → RED	01 (0.2 %)
Total	82 (13.0 %)	Total	23 (3.7 %)

Table 4: AWWs' Assessment Score related to Experience, Education & Refresher training

Variable	Number of AWWs	Average KAS	Average SAS	Average Total Score (SAS+KAS)
Experience				
d" 5 Years	15	10.9	8.6	19.5
> 5 Years	48	10.3	8.3	18.5
Education				
Primary	4	10	8	18.5
Secondary	52	10.3	8.3	18.7
Graduate & above	7	10.9	8.4	19.3
Refresher training				
Yes	52	10.3	8.3	18.7
No	11	10.6	8.5	19.1

Skill assessment of AWWs: As described in methodology, randomly 10 children's data from each AWC (total 630 children) were taken to assess skill of AWW regarding her growth monitoring practice. AWW's Skill Assessment Score (SAS) was determined by total correct classification of malnutrition given by her out of 10 selected children's data. Mean SAS was 8.32±1.5 meaning average 8 out of 10 children were correctly plotted on growth chart according to their malnutrition grade by AWWs. Difference in malnutrition classification given by AWWs and by the WHO anthro software is shown in Table 2.

On verifying the type of difference, whether the malnutrition grade of child was upgraded or downgraded, following results were found (Table 3). Upgrading was possible by three ways; red graded child described as yellow, yellow graded child described as green or red graded child described as green grade by AWWs. Same way downgrading also was possible by three ways, green graded child described as yellow grade, yellow graded child described as red or green graded child described as red grade of malnutrition by AWWs.

As the malnutrition grade on the basis of Weight for Age criteria was given by both anganwadi workers and WHO Anthro software, agreement between two was ascertained. Weighted kappa was found to be 0.8 with standard error of 0.03 at baseline. Weighted kappa shows there is a very good agreement in malnutrition grade given by AWWs and Weight for

Age Z score from WHO Anthro software but it was not sufficient in this case. 105 children out of 630 were incorrectly classified on growth chart by AWWs. Out of 105 children, 82 children were given better nutrition classification while they were malnourished and 23 children were diagnosed as malnourished or given severe classification while they were normal of having moderate malnutrition (Table 3).

On calculating correlation coefficient, Weak or no correlation was found between total score of AWW and their age ($r=-0.29$), education ($r=0.09$) and experience ($r=-0.19$). Average KAS, SAS and total scores did not show major difference with job experience, education status or refresher training status of anganwadi workers (Table 4).

Discussion:

This study was conducted to assess the knowledge and skill of AWWs with regards to growth monitoring among rural AWWs.

Evaluation report on ICDS states that most AWWs do not have much idea of the growth monitoring processes and medical assistance required by malnourished children.^[3] The present results of the study showed that a relatively large proportion of AWWs were aware of a number of key principles of growth monitoring. However, there were still some serious gaps in their knowledge and skills of AWWs irrespective of their education and experience.

In this study most of AWWs (87%) had knowledge that growth monitoring should start from birth. However in study by S. Bhasin et al only 43% of AWWs had the knowledge that growth monitoring can be started for a child at any age below 6 years.^[4]

In present study 53% AWWs had correct knowledge about steps of weighing child. 56% AWWs had knowledge that child should weighed twice to measure accurate weight of child. In a study by D. Chattopadhyay et al. majority of AWWs 91.3% suspended the scale freely and 65.2% suspended it at the level of the eye. 60.9% adjusted the scale to zero before weighing. All of them weighted the children with minimum clothing and without shoes and 60.9% took the reading from a distance of one foot. While 65.2% AWWs preferred to take the readings in fractions of 100 grams, none weighed twice to calculate the average and none put the readings on growth charts.^[5]

In contrast to this study results, majority (87 percent) of anganwadi workers were aware regarding various precautions to be taken during weighing of child in study by S. Manhas et al.^[6]

In present study 87% AWWs had correct knowledge that serial periodical weight measurement of child at regular interval is best method for growth monitoring similar results were found in study by S Bhasin et al. that 77% AWWs had correct knowledge about same topic.^[4]

Only 34% AWWs in this study had knowledge about all the sources (like Mamta card, birth certificate, local calendar) of getting birth date of child if not available. 67% AWWs had knowledge that correct age, sex and weight of the child are required for growth monitoring. In a study by A. Davey et al. only 40% AWWs were able to mention that correct age estimation of the children is essential for growth monitoring and malnourished children should be weighed monthly.^[7]

In present study 16% children were incorrectly plotted on growth chart by AWWs. Growth chart plotting was considered as skill of AWWs in this study. N. Thomas et al. found that 55.6% of AWWs knew how to plot the weight on the growth chart.^[8]

In present study 87% AWWs had adequate knowledge regarding zones of different grades of malnutrition and their interpretation. But 47% AWWs did not know which category should be considered when plotting of weight falls on junction of any two bands. S. Bhasin et al. found in their study that almost all (99%) of the AWWs had adequate knowledge regarding the significance of lines on the growth charts indicating different grades of nutritional status.^[4]

In present study only 9% AWWs were able to interpret descending curve as very dangerous for child whereas only 28% of AWWs were able to interpret that low weight for age results in flattened growth curve. A similar result also shown by U. Kapil et al. that the interpretation of all kinds of growth curves was generally poor. More than half of the AWWs could not interpret a flattened growth curve which meant that inadequate weight gain was not being recognized as a danger signal. Correct interpretation of ascending growth curve 65%, descending growth curve 63% and flattened growth curve 42%.^[9] In some studies like S. Bhasin et al. and A. Davey et al. noted that there were most of AWWs had correct knowledge about the importance of ascending, flattened and descending curves.^[4]

In this study Knowledge assessment score went on increasing as the experience in years was increasing but the difference was not statistically significant ($p > 0.05$). No relationship was found between the educational qualification of AWW and her knowledge about different services provided by her ($p > 0.05$) similar results were studied by T. Meenal et al.^[10]

Dissimilarity in results were found in study by Patil SB et al. that Knowledge assessment score went on increasing as the experience in years was increasing and the difference was statistically significant ($p < 0.05$). No relationship was found between the educational qualification of the worker and her knowledge about different services provided by her. ($p > 0.05$).^[11]

In this study variable such as educational qualification, experience and refresher training had no impact on KAP of AWWs. Similar results were noted in study by K. Sheela et al.^[12]

Conclusion and recommendation:

Very good agreement (κ 0.8) was found in malnutrition grades given by AWWs and Weight for Age Z score from WHO Anthro software but it was not as much as expected. Understanding of various aspect of growth monitoring was not good in AWWs of rural area in present study. Educational qualification, experience and refresher training had no significant impact on knowledge and skill of AWWs. The knowledge and efficiency of AWWs can be enhanced through frequent lectures and on-the-spot demonstrations. Further studies can be carried out with innovative techniques to improve skills of AWWs.

Declaration:

Funding: Nil

Conflict of Interest: Nil

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Prevalence of Obesity among School Going Adolescents in Urban and Rural Areas of District Meerut, Uttar Pradesh, India

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Abstract:

Introduction : The present century had noticed a rapid transition from undernourished to overweight and obesity. This transition was initially reported in developed countries but now this phenomenon has been noticed in developing countries. **Objective**: The study was conducted to assess the knowledge about the obesity among school going adolescents and to find out the sex wise and area wise relationship about the knowledge of obesity among the studied adolescents. **Method**: A cross-sectional study was conducted among 640 school going adolescents in Meerut, Uttar Pradesh, India from January 2019 to February 2019. Multistage sampling technique was used for enrolment of the study subjects. A pre-designed and pre-tested questionnaire was used. Body weight and height were recorded for calculating body mass index (BMI). The WHO BMI-for-age cut off classification of adolescents was used for the assessment of overweight and obesity. **Results**: A total of 640 adolescents participated in the study. Overweight and obese were more prevalent among male adolescents from urban area schools. In the present study, the overall prevalence of obese in rural area is 3.9% and overall prevalence of obese in urban area is 11.8%. The knowledge about hazards of obesity is statistically significant ($p < 0.05$) sex wise and area wise. Majority of the participants were aware about the obesity causing foods, preventive measures related to obesity and activities related to obesity in both rural and urban area schools. **Conclusion**: The present study pointed towards the rise in prevalence of overweight and obesity especially in male adolescents belonging to urban area schools thereby indicating the need to provide comprehensive targeted interventions for adolescents.

Key Words : Adolescents, Obesity, Overweight, Urban area schools, Rural area schools

Introduction:

In India, paediatric obesity is an emerging public health problem. The prevalence of paediatric obesity and overweight ranges from 9.9% to 18.5%.^[1] Increasing rates of overweight and obesity has reached epidemic proportions in developed countries and is rapidly increasing in many middle-income and less-developed countries^[2,3]. Obesity and overweight are an increasingly prevalent nutritional disorder among children and adolescents in the world.^[4,5] Due to the difficulty of curing obesity and overweight in adults and the many long-term adverse effects of childhood obesity, the prevention of child obesity has been recognized as a public health priority^[6]. Increasing evidence shows that childhood obesity and overweight have a profound influence on morbidity and mortality in adult life.^[7,8] Studies have shown that there had been significant gender

difference in the prevalence of obesity with more prevalence of obesity and overweight among male children compared to female children.^[9]

So, the present study is designed with the objectives to assess the knowledge about the obesity among school going adolescents in urban and rural area of Meerut district and to find out the prevalence of overweight and obesity among male and female adolescents attending urban and rural area schools and also the relationship between their knowledge about obesity and the actual BMI of the school going adolescents.

Method:

The present study was a Cross Sectional Study carried out for a period of two months from January to February 2019. Simple Random sampling method was used in the present study. A total of four schools (two schools from urban area and two schools from

rural area) were selected randomly from the list of schools obtained from the school authorities (District Education Office). Probability proportionate to size of the population technique was used to include adolescent students from both government and private institutions. At first, Meerut district was divided into urban and rural areas. Secondly, list of government/government-aided schools and private schools of Meerut urban and rural areas were prepared. Then, one government/government-aided school and one private school were randomly selected from the urban area. Two schools were randomly selected from the rural area. Prior permission was obtained from the principals of the selected schools for conducting the study. At last from each of the selected schools; list of all students from classes VI th to XIIth standard were obtained. Within school, all the students present on the selected day of interview were taken for the study. The studied adolescents belonged to age group 10 to 19 years. They were further classified into early adolescence (10-14 years) and late adolescence (15 to 19 years) according to UNICEF 2011 guideline^[10]. A day for the examination and interview was fixed for each school. The days were communicated to all the school authorities and their students. They were asked to be present on that day. On the basis of their presence on the day of interview and consent a total of 640 participants were selected for the study. A pretested structured questionnaire was used for the data collection. The questionnaire was divided into two parts namely anthropometric measurement and assessment of knowledge in relation to obesity.

In anthropometric measurement height and weight of the studied students were measured and subsequently Body Mass Index (BMI) was calculated using the formula $BMI = \text{Weight (Kg)}/\text{height (m}^2\text{)}$. Weight was collected with minimum accepted cloths using a bathroom scale weighing machine with accuracy up to 100gms. The participants were categorized into underweight, normal, overweight and obese using WHO growth standards 2007^[11]. The participants having the BMI 5th percentile and below of WHO Growth standards were considered as underweight, BMI value between 6th to 85th percentile were considered as normal. The values between 85th percentile and 97th percentile were

classified as overweight and a value above 97th percentile were classified as obese. Height was recorded with a standiometer of maximum length of 5m. The participants were asked to stand bare foot on a standiometer with the back facing the measuring scale. With a head straight a marked was made on the scale and the student was asked to move away from the standiometer. For assessment of knowledge participants were presented with an open ended question on the foods related to obesity, activities preventing obesity, hazards of obesity and prevention of obesity. Data analysis was done by SPSS version 17 software. The association was established by using chi-square test and odds ratio.

Results:

A total of 640 participants were interviewed from both rural and urban area schools. Out of them there were 256 participants from rural area schools and 384 participants from urban area schools. Out of the 256 participants studied of rural area schools, 102 (39.8%) were male among which 60 (58.8%) were of early adolescence and 42 (41.2%) were of late adolescence (According to UNICEF 2011 guideline^[10]). Out of the 256 participants studied, 154 (60.2%) were female among which 102 (66.2%) were of early adolescence and 52 (33.8%) were of late adolescence. Out of the 384 participants studied of urban area schools, 202 (52.6%) were male among which 94(46.5%) were of early adolescence and 108(53.5%) were of late adolescence. Out of the 384 participants studied, 182 (47.4%) were female among which 110 (60.4%) were of early adolescence and 72 (39.6%) were of late adolescence. (Table 1)

Of the 640 participants studied they were classified into normal, overweight and obese using WHO growth standards 2007. In the present study the sex wise prevalence of overweight in male is 54(8.4%) and in female are 30(4.6%). Prevalence of obese in males is 10(1.5%) and in females 8(1.3%) and ($\chi^2=0.483$, $p>0.05$). In the present study the school wise prevalence of overweight in the rural area schools is 20(3%) and in urban area schools is 64(10%). Prevalence of obese in rural area schools is 6(0.9%) and in urban area schools is 12(1.8%) and ($\chi^2=0.708$, $p>0.05$). (Table 2)

Table 1: Age-wise and Sex-wise distribution of studied adolescents among Rural & Urban area Schools (N=640)

Age(years)	Rural area School (n=256)		Urban area School (n=384)		Total (N=640)	
	Male (n=102) & %	Female (n=154) & %	Male (n=202) & %	Female (n=182) & %	Male (n=304) & %	Female (n=336) & %
Early adolescence (10-14)	60 (58.8)	102 (66.2)	94 (46.5)	110 (60.4)	154 (50.7)	212 (63.1)
Late adolescence (15-19)	42 (41.2)	52 (33.8)	108 (53.5)	72(39.6)	150 (49.3)	124 (36.9)
Total	102 (100)	154 (100)	202(100)	182 (100)	304 (100)	336 (100)

Table 2: Prevalence of studied adolescents on the basis of Overweight & Obesity (N=640)

Determinants	Overweight (85 TH - 95 TH Percentile) (n=84)		Obese (>95 TH Percentile) (n=18)	
Sex-wise				
	Male (n=54)	Female (n=30)	Male (n=10)	Female (n=08)
Prevalence (%)	8.4	4.6	1.6	1.3
Chi-square-test=0.483 with d.f.=1, p>0.05 (not significant)				
School-wise				
	Rural area schools (n=20)	Urban area schools (n=64)	Rural area schools (n=06)	Urban area schools (n=12)
Prevalence (%)	03	10	0.9	1.8
Chi-square-test=0.708 with d.f.=1, p>0.05 (not significant)				

To determine the sex wise and area wise relationship between the knowledge about the obesity, the Odds ratio and p value using chi-square test was calculated. For males, overweight and obese were grouped into one group (54+10=64) and normal and underweight into another group (240). Similarly for females, overweight and obese were grouped into one group (30+08=38) and normal and underweight into another group (298). (Table 3)

Percentage of overweight (7.8% in rural area and 16.7% in urban area), obese (2.3% in rural area and 3.1% in urban area) and normal (89.9% in rural area and 80.2% in urban area) among studied participants were reflected in the (Figure 1).

Discussion:

In the present study, 640 school going adolescents were studied from both urban and rural area schools. Among studied adolescents, 10.1% to 19.8% were reported as overweight or obese from rural to urban area respectively. This is somewhat similar to the result obtained by other researchers like, Jagadesan S et al.^[12], Kar S et al.^[14] and Kotian MS et al.^[15] However, it is different from the rates reported by Kaur S et al.^[16] and Jacob SK et al.^[13]. This difference in the percentage of overweight and obese among urban and rural area studied adolescents may be due to the difference in the criteria we have adopted for the classification of the obesity. It may also be due to

Table 3: Sex- wise and area-wise relationship between the studied adolescents about the knowledge of obesity (N=640)

Knowledge	Correct response (%)	Incorrect response (%)	Odds ratio (At 95% C.I.)	Chi-square -value*
1. Obesity related foods				
Male (n=304)				
a. Overweight and obese(n=64)	56(87.5)	08(12.5)	0.5714	0.169
b. Normal and underweight(n=240)	192(80.0)	48(20.0)	(0.2553-1.2788)	(p>0.05)
Female (n=336)				
a. Overweight and obese(n=38)	30(78.9)	08(21.1)	1.1034	0.816
b. Normal and underweight(n=298)	240(80.5)	58(19.5)	(0.4807-2.533)	(p>0.05)
2. Hazards related to overweight and obesity				
Male (n=152)				
a. Overweight and obese(n=64)	28(43.8)	36(56.2)	3.101	0.00009
b. Normal and underweight(n=240)	168(70.0)	72(30.0)	(1.7037-5.2826)	(p<0.05)
Female (n=168)				
a. Overweight and obese(n=38)	36(94.7)	02(5.3)	0.1068	0.0003
b. Normal and underweight(n=298)	196(65.8)	102(34.2)	(0.0252-0.4523)	(p<0.05)
3. Preventive measures related to overweight and obesity				
Male (n=152)				
a. Overweight and obese(n=64)	20(31.3)	44(68.7)	1.4667	0.201
b. Normal and underweight(n=240)	96(40.0)	144(60.0)	(0.8144-2.6413)	(p>0.05)
Female (n=168)				
a. Overweight and obese(n=38)	22(57.9)	16(42.1)	1.1094	0.766
b. Normal and underweight(n=298)	180(60.4)	118(39.6)	(0.5595-2.1998)	(p>0.05)
4. Activities related to overweight and obesity				

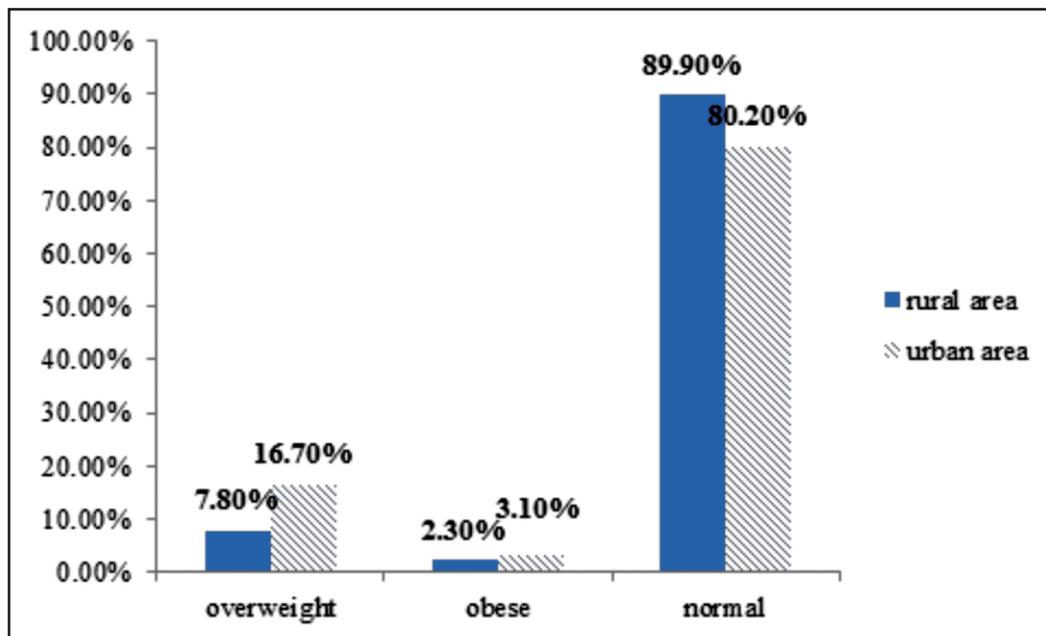
*(p>0.05) =Not significant and (p<0.05) = Significant.

the fact that there is urban and rural area variation in the obesity.

On school wise evaluation, it was found that there is higher prevalence of obesity among the adolescents of urban area schools (3.1%) as compared to the adolescents of rural area schools (2.3%). This difference indicates the combined effect

of various associated factors contributing to obesity as lifestyle, eating habits, socio economic status of the urban area schools etc. However in the present study this difference is not significant and this could be due to the small sample size of the study. Other researchers with larger sample size have reported such differences in their study.^[13,14,16-18]

Figure 1: Percentage of overweight, obese and normal adolescents in Rural and Urban area schools (N=640)



On sex wise evaluation, it was noted that overweight and obesity was more prevalent in the male adolescents (10.0%) of both urban and rural area compared to female adolescents (5.9%) of both urban and rural area. This is again in line with the findings of other researchers like kar S et al. ^[14]

On evaluation of questions related to the assessment of their knowledge related to obesity, it was found that the majority of the studied adolescents, 81.6% among male adolescents and about 80.4% among female adolescents in both urban and rural areas were aware about the foods that cause obesity. This is against the findings of Cherian AT et al ^[19] in Chennai. However it is similar to the findings of Njelekela MA et al ^[20] and Srivastava DK et al. ^[9].

On evaluation of questions related to the hazards of obesity, it was found that 35.5% of male adolescents and 30.9% of female adolescents belonging to both urban and rural area schools were unaware or gave incorrect response to questions related to hazards of obesity. This is important as unawareness about the hazards of obesity can make children careless about their eating and exercising habits. This is in contrast to the finding as noted by Srivastava DK et al. ^[9] in relation to sex wise adolescents.

It was found in the present study that 61.8% of male and 39.9% of female were unaware about how to prevent obesity. This is in line with the above finding that large numbers of students were unaware about the hazards of obesity and therefore unaware about how to prevent obesity. Similar finding were noted by Srivastava DK et al. ^[9] in relation to sex wise adolescents.

Regarding the evaluation of questions related to the activities that cause obesity, it was found that only 59.9% of the male adolescents and 39.8% of female adolescents were aware about the activities that promote obesity. These finding are important as various nutrition related programmes are directed towards creating awareness among school going adolescents regarding obesity, its hazards and how to prevent it plays a pivotal role in control of certain future diseases. This is similar to the findings of other researcher like Njelekela MA et al ^[20] and Triches RM et al ^[21]. These finding in relation to sex of adolescents are in contrast to the finding as noted by Srivastava DK et al. ^[9]

In the present study on applying univariate analysis between the knowledge and obesity status, it was found that the adolescents of both rural and urban areas, who were unaware about the hazards of

obesity were more obese than those who were aware (OR =3.101(CI 1.7037 to 5.2826) for male adolescents and OR=0.1068 (CI0.0252 to 0.4523) for female adolescents) Triches RM et al.^[21], Kelishadi Ret al.^[22] and Srivastava DK et al.^[9] has also noted similar strong association ($p < 0.00001$) in their study.

In the present study it was found that knowledge of foods causing obesity, the prevention of obesity and the activities that causes obesity were not significantly associated with obesity status. This difference could be due to the fact that the present study was carried out with a small sample size.

Conclusion and Recommendations:

In short, the present study showed that there is an increasing trend of the obesity among adolescents studying in urban area schools. The study also concludes that obesity is more common and showing an increasing trend among male adolescents compared to female adolescents in both urban and rural area schools. This calls for immediate action in both urban and rural area schools to reduce the prevalence of obesity through appropriate nutritional interventions involving various programmes including school teachers, school authorities and their parents.

Declaration:

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Conflict of Interest: Nil

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A Study on Assessment of Services Rendered Under the Rashtriya Swasthya Bima Yojana Scheme in Jamnagar District: A Cross Sectional Study

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Abstract :

Introduction: In India, poverty is propagated due to sickness, 1% of the poor are estimated to fall below the poverty line tending to their illness, and an estimated 65% of the poor in India get further into debt. To reduce out of pocket (OOP) expenditure for health care and lessen a considerable financial burden on the poor, a national health insurance scheme, Rashtriya Swasthya Bima Yojana (RSBY) was launched in 1st April 2008. **Objectives:** The present study was conducted to assessment of services rendered under the RSBY scheme with the aims & objectives, 1. To describe the socio-demographic characteristic and health problems of the patients who availed the benefits of RSBY in last one year; 2. To assess the medical and other support services rendered under RSBY scheme by government and private empanelled hospitals; 3. To assess the attitude of beneficiaries towards RSBY scheme in terms of satisfaction with the treatment provided. **Method:** Total 176 household interviewed from study district. A pretested semi structured questionnaire was used to interview a respondent from the family. The data entry was done using EPI INFO and data analysis was done using EPI INFO, Microsoft Office Excel 2007 and MedCalc. **Results:** 59.7% beneficiaries were coming from less than 10 km from the hospital. Medical and surgical causes were the major problems. 89.8% of beneficiaries were asked to get medicine from outside. 76.7 % beneficiaries were provided free food during stay at the hospital. 87.5% of the patients got discharged summary. 92.6% of the patients responded that finger Print Verification was done on Discharge. 76.1% beneficiaries were not told about the amount left in the card at the time of discharge. **Conclusion:** Majority of the patients in private hospital availed surgical treatment. Patients in private hospital were more satisfied with the services rendered in RSBY.

Key Words : Health Insurance, Service Satisfaction, RSBY, Utilization

Introduction :

Poverty is a relative phenomenon and multi-faced wretched state of deprivation of basic minimum needs, facilities and services. There are different levels to its adverse influence on individual, family and community.^[1]

Poor health not only leads to financial bankruptcy but also gives many sufferings to the affected individual and their family. Health is a fundamental human right and it is the responsibility of the governments, both at the central and states, to provide health care to all people in equal proportions. Total health care boosts economic growth, reduces poverty and lowers mortality rates. The saga of success of many countries lies in their special effort to provide the entire population with good health care facilities.^[2]

A World Bank study, reports that approximately one-fourth of the Indian population fall below the poverty line due to hospitalization costs. It has also been estimated that OOP expenditure on health care might have raised the proportion of the population in poverty by 2%.^[3]

An estimated 150 million have been reported as spending more than 40% of their income on their health needs, which could contribute to the vicious cycle of poverty perpetuating poverty.^[4] India spends about 4.3% of its GDP on healthcare. However, 72% of this money is paid by individual households through (OOP) payments at the time of illness, representing one of the highest proportions of OOP in the world.^[5]

In India, the government acts as both a financer as well as a provider of health care.^[6] In India, poverty is

propagated due to sickness, 1% of the poor are estimated to fall below the poverty line tending to their illness, and an estimated 65% of the poor in India get further into debt.^[4] Evidence shows that in India about 6% of patients do not seek care for financial reasons.^[7]

Announcement regarding Rashtriya Swasthya Bima Yojana (RSBY) was done by the former Prime Minister Manmohan Singh on August 15, 2007.^[8] The RSBY was launched on 1st April 2008, explicitly to protect the poor from catastrophic hospital expenditure.^[9] RSBY is India's first social security scheme that embraces a profit motive, and is a good example of public-private partnership in the social sector.^[10]

All poor households in the national below poverty line (BPL) are eligible to enroll in this scheme. RSBY is a voluntary private health insurance scheme, wherein a BPL family of (maximum) five people can be enrolled with Insurance Company by paying a token enrolment fee of INR 30 per family per year. Insurance companies enroll BPL families and provide them with a RSBY "smart card" that contains the biometric details of the enrolled family; the smart card is necessary for all transactions at the hospital. The premium for each family is paid by the government directly to the insurance company.^[9]

This national health insurance scheme aims at providing health insurance to households living below poverty line (BPL) in order to protect them from major health shocks that involve hospitalization up to INR 30,000.^[4]

Those BPL people are usually penniless and illiterate or semi-illiterate and many of them now are migrant workers. So RSBY beneficiaries' utilization of inpatient healthcare is cashless, paperless and highly portable. Despite so many advantages, it is very surprising that the enrolment rate and utilization of RSBY are still very low.^[11]

As on date April 30 2014 number of active RSBY card holders were 37,191,843 in India and 7,163,935 hospitalized cases were documented under RSBY scheme all over India.^[12] Total 1407 hospitalizations under RSBY scheme were documented during year 2013-14. The current study intended to assessment of services rendered under the scheme in Jamnagar

district and explores various factors that influence people's decision to join or the barriers to enrollment in the scheme.

Method:

According to census 2011, population of the study district is 14, 07, 635 (Urban: 7, 29,270; Rural: 6, 78, 365). The sex ratio is 938:1000.^[13] In study district total 86,059 BPL families are there among them 23,508 are RSBY card holders. There are total 11 RSBY empanelled hospital in study district. Among them 7 hospitals are government and 4 are private hospital. Total 1595 RSBY beneficiaries were hospitalized during April 2013 to March 2014. The present study was a cross sectional study conducted in urban and rural areas of the study district. The study was carried out from Aug 2014 to July 2015.

Sample size: To evaluate the services rendered under RSBY scheme, it was decided to study 10% of the beneficiaries who availed services in last one year from public as well as private health institutions. In study district total 1407 patients got benefit from government RSBY empanelled hospital and 188 patients got benefit from private RSBY empanelled hospital in last one year. So 10 % of those patients i.e., 141 beneficiaries from government hospital and 19 from private hospitals was the desired sample size. After adding 10% non-respond rate, sample size came to be 155 and 21 patients from government and private hospitals respectively. So the total sample size was 176 patients.

Sampling method and sample selection: List of patients who were admitted in government or private hospitals during April 2013-March 2014 and got benefits of RSBY scheme was obtained from district RSBY programme office. Using random number table, required sample (i.e. 155 patients from government hospitals and 21 patients from private hospitals) was selected from the list.

Ethical Clearance: Ethical approval was taken before the commencement of the study from the ethical committee of the concerned institution.

Method of data collection: A pretested semi structured questionnaire was used to interview a respondent from the family. General demographic profile of enrolled family members, utilization of

RSBY scheme and awareness regarding various components of RSBY were recorded.

For evaluation of services provided by hospitals in RSBY scheme patients or attendants were interviewed using pretested semi structure questionnaire and their responses towards services they availed were recorded.

House to house visit of the selected beneficiaries or patients was done. The purpose of the study was explained and informed consent was obtained before starting the interview.

Statistical analysis: The data entry was done using EPI INFO version 3.5.3 and data analysis was done using EPI INFO, Microsoft Office Excel 2007, SPSS version 21 and MedCalc.

Table 1 show that there were 42.6% of hospitalized beneficiaries above the age of 49 years and only 5.7% of hospitalized beneficiaries between the ages of 20-29 years. Three fifth hospitalized beneficiaries were male and 40.9% were female. More than two third of hospitalized families belonged to SEBC category. More than three fifth beneficiaries were coming from the urban area.

Results:

Table 1: Demographic characteristics of hospitalized beneficiaries

Demographic characteristics	Government N=155	Private N=21	Total N=176
Age group (in years)			
0 - 19	26 (16.8%)	2 (9.5%)	28 (15.9%)
20 - 29	7 (4.5%)	3 (14.3%)	10 (5.7%)
30 - 39	20 (12.9%)	6 (28.6%)	26 (14.8%)
40 - 49	33 (21.3%)	4 (19.0%)	37 (21.0%)
>49	69 (44.5%)	6 (28.6%)	75 (42.6%)
Gender			
Male	95 (61.3%)	9 (42.9%)	104 (59.1%)
Female	60 (38.7%)	12(57.1%)	72 (40.9%)
Social group			
SEBC	107 (69.0%)	14 (66.7%)	121 (68.8%)
SC	11 (7.1%)	2 (9.5%)	13 (7.4%)
ST	7 (4.5%)	2 (9.5%)	9 (5.1%)
Other	16 (10.3%)	1 (4.8%)	17 (9.7%)
Don't know	14 (9.0%)	2 (9.5%)	16 (9.1%)
Locality			
Rural	60 (38.7%)	5 (23.8%)	65 (36.9%)
Urban	95 (61.3%)	16 (76.2%)	111 (63.1%)

(For age group Mean = 44.86, SD = 19.48)

Table 2: Distribution based on distance, health problem and condition of the patient

Characteristics	Government N=155	Private N=21	Total N=176
Distance (km)			
0 - 10	86 (55.5%)	19 (90.4%)	105 (59.7%)
11 - 20	18 (11.6%)	1 (4.8%)	19 (10.8%)
>21	51 (32.9%)	1 (4.8%)	52 (29.5%)
Health Problem			
Medical	51 (32.9%)	0 (0.0%)	51 (28.9%)
Surgical	46 (29.7%)	6 (28.6%)	52 (29.5%)
Orthopedic	38 (24.5%)	1 (4.8%)	39 (22.2%)
Gynecological	3 (1.9%)	3 (14.3%)	6 (3.4%)
Ophthalmological	8 (5.2%)	3 (14.3%)	11 (6.3%)
Ent	9 (5.8%)	8 (38.0%)	17 (9.7%)
Condition of The Patient			
Able to walk own or support	109 (70.3%)	20 (95.2%)	129 (73.3%)
Needed stretcher	46 (29.7%)	1 (4.8%)	47 (26.7%)

(For distance Mean = 20.53, SD = 25.90)

Table 2 shows that in government hospital 55.5% beneficiaries were coming from less than 10 km distance as compared to 90.4% beneficiaries in private hospital. The reasons for the hospitalization varied from person to person. Medical (acute pharyngitis, chest pain, diabetes etc...) and surgical (abdominal pain, acute appendicitis, acute enteritis etc...) causes were the major problems i.e. 28.9% and 29.5% respectively followed by orthopedic problems (22.2%) for which patients under RSBY scheme sought the treatment. In government hospital 70.3% patients were able to walk by own or support and in private hospital 95.2% patients were able to walk by own or support. This difference is statistically significant. (P=0.031)

Table 3 reflects that among the studied beneficiaries, 94.9% stated that there was a help desk and this proportion was more in government hospitals. Transportation cost was reimbursed to only 68.2% of the patients. In government hospital

74.8% and in private hospitals 19% patients got travelling expenses. In private hospital 85.7% admitted through OPD as compared to 51.6% in government hospital.

As per above table in private hospital 52.4% patients and in government hospital 23.9% patients were asked to get investigation done from outside during admission. This difference is statistically significant (p=0.006). Majority (i.e. 89.8%) of beneficiaries were asked to get medicine from outside. Among the government hospital 92.3% beneficiaries and among private hospital 71.4% beneficiaries were asked to get medicine from outside during hospital stay. This difference is statistically significant (p=0.003). In government hospital 85.2% beneficiaries and in private hospital 14.3% beneficiaries were provided food during stay at hospital. This difference is statistically significant (p<0.001).

Table 3: distribution based on services rendered before hospitalization

Services on admission	Government N=155	Private N=21	Total N=176	□ 2- Value	P-Value
Availability Of Help Desk	149 (96.1%)	18 (85.7%)	167 (94.9%)	4.134	< 0.05
Reimbursement of transportation Cost	116 (74.8%)	4 (19.0%)	120 (68.2%)	24.026*	<0.001
Admitted through OPD	80 (51.6%)	18 (85.7%)	98 (55.7%)	7.388	0.007

*Yates' chi-square

Table 4: Distribution based on services rendered during hospitalization

Services during hospitalization	Government N=155	Private N=21	Total N=176	□ 2- Value	P-Value
Investigation done from outside	37 (23.9%)	11 (52.4%)	48 (27.3%)	7.579	0.006
Prescribed medicine from outside	143 (92.3%)	15 (71.4%)	158 (89.8%)	8.739	0.003
Food Provided	132 (85.2%)	3 (14.3%)	135 (76.7%)	48.102*	<0.001

*Yates' chi-square

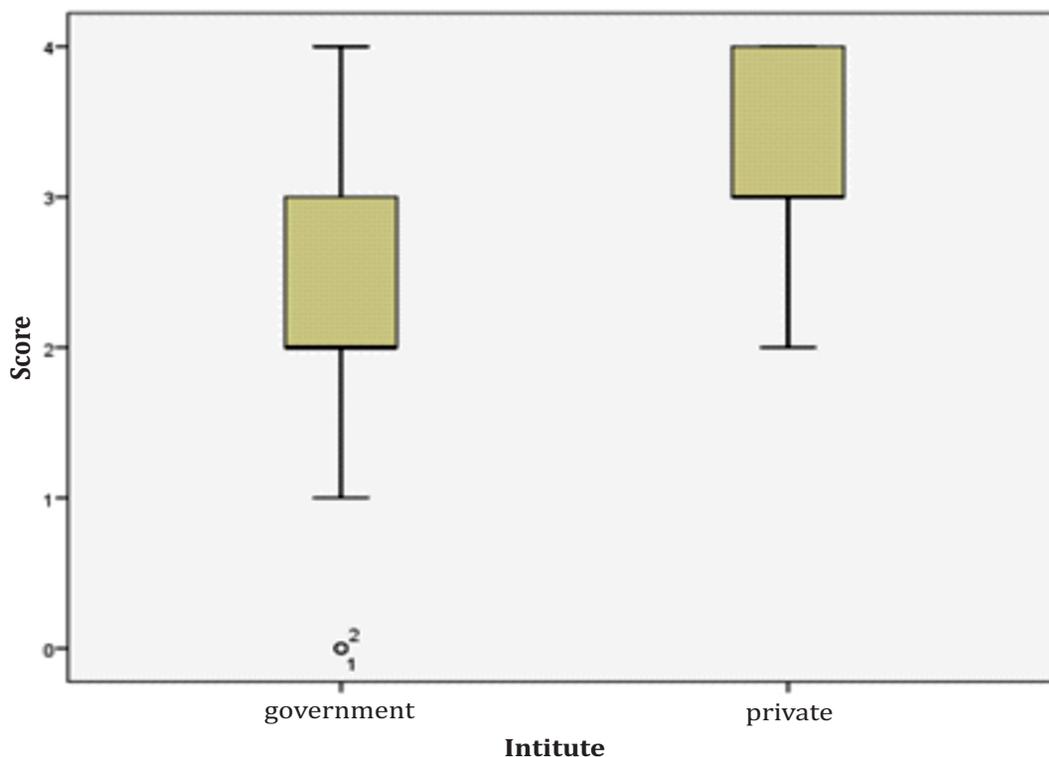
Table 5: Distribution based on services rendered at the time of discharge

Services on discharge	Government N=155	Private N=21	Total N=176	□ 2- Value	P-Value
Discharge summary provided	134 (86.5%)	20 (95.2%)	154 (87.5%)	1.298	0.2546
Fingerprint verification done	143 (92.3%)	20 (95.2%)	163 (92.6%)	0.239	0.6251
Whose finger print (patient)	54 (37.8%)	18 (90.0%)	72 (44.2%)	19.296	< 0.0001
Receiving smart card back	151 (97.4%)	20 (95.2%)	171 (97.2%)	0.317	0.5734
Whether informed about amount left	32(20.6%)	10(47.6%)	42(23.9%)	7.364	0.0067

Above table shows that majority (i.e.87.5%) of the patients got discharge summary. This proportion was found to be high for private hospital as compared to government hospital BUT difference is not significant. Majority (i.e.92.6%) of the patients responded that finger Print Verification was done on Discharge. This proportion was almost same for government and private hospital beneficiaries. On asking, whose fingerprint was taken on discharge, Patients' fingerprint verified in 90.0% of private and

37.8% government hospital beneficiaries. This difference is statistically significant (p<0.001). Almost 97.2% of beneficiaries received the Smart Card Back on the Day of Discharge. This proportion was found to be same for government hospital (97.4%) and private hospital (95.2%). In government hospital 79.4% of beneficiaries and in private hospital 52.4% of beneficiaries were not told about the amount left in the card at the time of discharge. This difference is statistical significant (p=0.006).

Figure 1: patients' satisfaction for RSBY services during hospitalization



Box plot cart in the figure sows satisfaction score of the patients for services rendered under RSBY scheme at government and private hospitals. Median satisfaction score of the patients who availed services at government hospital was 2 (IQR 2-3) as compared to median score of 3 (IQR 3-4) for private hospital patients. Tis difference was statistically significant. (Mann-Witney U test was applied since score did not follow normal distribution) $U=723.5, p>0.001$.

Discussion :

This study found that 42.6% of hospitalized beneficiaries above the age of 49 years while “RSBY-CHIS Evaluation Survey”^[1] and Jaimin Patel et.al (2013)^[14] in Ahmedabad found same.

Our study showed that Medical and surgical causes were the major problems i.e. 28.9% and 29.5% respectively which is more or less same as study “RSBY-CHIS Evaluation Survey”^[1] and “Evaluation of implementation of Rashtriya Swasthya Bima Yojana in select districts of Bihar, Uttarakhand and Karnataka”.^[15] In the study “RSBY-CHIS Evaluation Survey” it was found that 58.3% stated that they were able to walk without the help of others at the time of

admission, 25.9% of patients on the other required stretcher or wheelchair. The rest i.e., 15.7% were able to walk with the support of others.^[1] almost similar picture seen in our study.

In the study, “RSBY-CHIS Evaluation Survey” 88.9% of the beneficiaries affirmed the existence of RSBY help desk at the hospitals and 8.3% beneficiaries were unaware about the RSBY helpdesk while 2.8% beneficiaries reported that there was no RSBY helpdesk in the hospital. Almost similar trend was seen in our study.^[1] P.P. Mini (2013) in his study found that Even though there is a provision of traveling allowance of Rs.100 in the scheme, only 19.3% of the beneficiaries received it, whereas about 80.7% beneficiaries denied with it.^[2] In our study similar trend seen in private hospital but in government hospital 74.8% of the beneficiaries received it. In the study “RSBY-CHIS Evaluation Survey” it was found that Majority (73.1%) of the admissions were reported to be through the Out Patient Department. 24.1% were admitted through Emergency. The remaining 2.8% were through referrals.^[1]

In the study “RSBY-CHIS Evaluation Survey”, it was found that 75% of patients reported that they were not asked to do any diagnostic tests from outside.^[1] In the study, “RSBY-CHIS Evaluation Survey” 75.9% was not asked to purchase medicines from outside. Only 24.1% were asked to purchase from outside.^[1] In the study “RSBY-CHIS Evaluation Survey” it was found that 70.4% patients, the hospitals provided food for the patients during their stay at the hospitals.^[1] More or less similar finding in government hospital but in private hospital only 14.3% of the beneficiaries received it. This indicates many benefits of the scheme are not given to the beneficiaries in private hospital.

In our study found that 87.5% of the beneficiaries were aware of about receiving discharge summary and 92.6% of the beneficiaries were aware of about finger print verification during discharge. This is differ from P.P. Mini (2013) study.^[2] This indicate good implementation of the scheme in our study area. In the study “RSBY-CHIS Evaluation Survey” it was found that 66.7% patients stated that it was their finger print that was verified at the time of discharge. For 33.3% of patients, the family member did it.^[1] In our study found that 97.2% beneficiaries received the smart card on the same day of discharge. Almost similar finding in P.P. Mini (2013) in his study.^[2] P.P. Mini (2013) in his study found that about 52.6% of the beneficiaries were aware about money left in the smart card at the time of discharge.^[2] In the study “RSBY-CHIS Evaluation Survey” it was found that 64.8% were not informed about money left in the card. Only 35.2% affirmed about the receipt of information regarding the money left in the card.^[1]

Conclusion:

Majority of the patients in private hospital availed surgical treatment and identifying the help desk and admission procedures were easy in private hospital but very few patients reported reimbursement of transportation cost. During admission in private hospitals, more patients reported outside investigations while outside drugs were prescribed more to patients in government hospitals. On discharge all, the services were better in private hospitals. Patients in private hospital were more satisfied with the services rendered in RSBY.

Declaration:

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Conflict of Interest: Nil

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Risk Factor Profile of Young Adult Myocardial Infarction (MI) Cases : A Cross-Sectional Study at Tertiary Care Centre of Gujarat, India

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Abstract :

Introduction: Myocardial Infarction (MI) is a life threatening clinical condition. It is a multifactorial non-communicable disease involving interplay of many modifiable and non-modifiable risk factors. **Objective:** The study was conducted with objective to study socio-demographic profiles and distribution of risk factors among young adults having MI. **Method:** A study was conducted at tertiary care centre of Rajkot, Gujarat. One year time frame was decided for this cross-sectional study. All the patients having age <45 years admitted in Intensive Care Unit (ICU) of Medicine department with first attack of MI were interviewed and examined for various clinic-epidemiological determinants of MI. **Results:** Total 106 young MI cases were enrolled in the study. Relative frequency showed male preponderance (88.7%). Risk factors like tobacco uses, sedentary life-style and obesity were identified as risk factors relatively more frequently associated with young MI cases. In contrast to old MI cases, proven risk factors like hypertension and diabetes mellitus were found less frequently associated. About one third of the cases were lacking adequate amount of protective foods (green leafy vegetables and fruits) in their daily diet. Four patients without any risk factor except male gender were noted. 50% cases were having three or less number of risk factors. **Conclusion:** The findings suggest male preponderance, tobacco consumption, sedentary life-style and obesity as quite common risk factors of premature Coronary Artery Disease (CAD).

Key Words : Coronary Artery Disease, Myocardial Infarction, Risk Factors, Young Age

Introduction :

India has observed rapid transition from burden of communicable diseases to non-communicable diseases over the past couple of decades and Ischemic heart disease (IHD) is established as modern era's epidemic. Global and national data pointed out that as per situation in 2014, IHD ranked 1st causing deaths and disabilities, both globally and nationally.^[1,2] More than half of the worldwide cardiovascular disease risk burden is estimated to be borne by Indian subcontinent by 2020.^[3] Moreover migration studies showed that Indians are 3-4 times higher at risk of Coronary artery disease (CAD) than White Americans, 6 times higher than Chinese and 20 times higher than Japanese.^[4,5] Not only that but Indians are also prone to CAD at much younger age.^[6] Studies carried out in India, and other places suggest that Asian in general and Indians in particular are at an increased risk of MI at younger age (<40 years).^[7] The

proportion of CAD in young Indians is about 12%-16%.^[8,9]

Although the role of conventional risk factors for coronary artery disease is proven for all age groups, younger patients show different risk factor profile, clinical presentation and prognosis. Management of young patients is a challenging task as they are the main income producer of the family. Myocardial infarction at an early age is an important problem for the consulting physician as well because it is having devastating effect on quality of life and survival of young adults. So, present study was conducted to identify the proportion of young MI cases and risk factor profile of MI cases having age <45 years.

Method:

The cross-sectional study design was adopted for present study. It was conducted from 1st April 2016 to 31st March 2017 at PDU Govt. Medical College Hospital, Rajkot. The hospital is a tertiary care centre

catering entire Saurashtra region of Gujarat. There is disparity in literature for the cut-off age of young Myocardial Infarction (MI) case varying from <30 years to <55 years. Cut-off point of 45 years age was used to define young MI patient.^[10] The study subject enrolled in the study were selected from the patient admitted in the Intensive Care Unit (ICU) of Medicine department having first attack of MI. Following an attack of MI, person's habits and risk factors profile might be altered because of post-MI life-style modifications. So, only the persons having first known MI incident were enrolled in study. Patients below 45 years of age who were conscious, cooperative, well oriented were enrolled after informed consent. Patients seriously ill, unconscious or non-willing to participate were excluded from the study.

For this study a person was considered as a case of MI, if any two of the following three criteria were satisfied: (1) ECG showing ST segment elevation, (2) rise in CK-MB levels > 25 IU/l or (3) symptoms of ischemia lasting for > 20 minutes (complain of left sided chest pain which was compressive in nature, ill localized, radiating to upper extremity, mandibular or epigastric region; may or may not be associated with nausea, vomiting, palpitation, excessive sweating or difficulty in breathing).^[11,12] Patients were admitted and treated by the treating physician of Medicine department, PDU Hospital, Rajkot. All investigations were done on the basis of physician's description.

The study was approved by institutional ethical committee. Data collection was done by an interview technique using preformed, pretested and semi-structured questionnaire. Questionnaire included information regarding socio-demographic profile, risk factor profile, addiction history, diet profile and notes on examination measurements. Clustering of risk factors was analysed using ten risk factors named male sex, positive family history, hypertension, diabetes, tobacco consumption, alcohol consumption, history of OC pills consumption, sedentary life style, stress due to acute life event, obesity and frequency of protective diet intake <5 days per week. Persons having continuous daily physical exercise of less than 30 minutes a day for 5 days a week were considered physically active. Persons not fitting in the definition were considered

as having sedentary life style. Modified Prasad's socioeconomic classification was used considering All India Consumer Price Index (AICPI) of April, 2017 of Rajkot.^[13] Body Mass Index (BMI) was calculated and classified using World Health Organization (WHO) classification.^[14] Cut-off points for high waist to hip ratio (W:H ratio) were adopted from the WHO guideline stating W:H ratio ≥ 0.90 for male and ≥ 0.85 for female is having substantially increased risk of metabolic complications.^[15] Data entry was done in Microsoft Office Excel 2007 and analysis was done using the software package Epi Info (Version 7.2.2.6) from CDC, Atlanta, U.S.A.^[16]

Results:

Total 106 young MI patients having first attack of MI were admitted at PDU Hospital, Rajkot during one year period. It is 26.1% of total 406 cases admitted during this period. The youngest patient of MI in present study was of 24 years only. The study showed that 6.6% among young MI cases were below the age of 30 years. Steep rise observed at the age of 35 years. There was a male preponderance with 88.7% males and 11.3% females. (Table 1)

Table 1: Age and sex distribution of young myocardial infarction cases

Age (in years)	Male (%)	Female (%)	Total (%)
21 - 25	2 (1.9)	0 (0.0)	2 (1.9)
26 - 30	5 (4.7)	0 (0.0)	5 (4.7)
31 - 35	13 (12.3)	1 (0.9)	14 (13.2)
36 - 40	32 (30.2)	6 (5.7)	38 (35.8)
41 - 45	42 (39.6)	5 (4.7)	47 (44.3)
Total	94 (88.7)	12 (11.3)	106 (100.0)

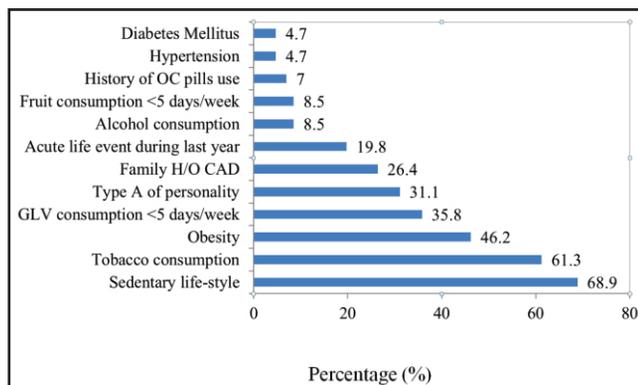
Present study revealed that most of the cases were from urban area, joint family and literate. Manual labourer was the single group having more than half of cases. More than half of the cases were from upper middle and upper socio-economic class. (Table 2)

Table 2: Socio - demographic profile of young myocardial infarction cases

Variable	Frequency (%)
Residence	
Urban	79 (74.5)
Rural	27 (25.5)
Marital status	
Married	105 (99.1)
Unmarried	1 (0.9)
Literacy status	
Illiterate	15 (14.2)
Literate	91 (85.8)
Occupation	
Service	34 (32.1)
Manual labour	56 (52.8)
Household	12 (11.3)
Agriculture	4 (3.8)
Socio - economic class	
Class I & II	58 (54.7)
Class III	36 (34.0)
Class IV & V	12 (11.3)
Type of family	
Nuclear	42 (39.6)
Joint	64 (60.4)

In present study it was found that all the frequently related risk factors of MI were modifiable risk factors except male preponderance and positive family history of CAD among first order relatives. Sedentary life-style (68.9%), tobacco consumption (61.3%) and obesity (46.2%) ranked on first 3 positions while hypertension (4.7%) and diabetes mellitus (4.7%) both stood as at the lowest rank as related risk factors among young MI cases. (Figure 1)

Figure 1: Comparison of risk factors present in young myocardial infarction patients



Family history of CAD was present in 26.4% cases while tobacco consumption was present in 61.3% cases. Consumption of leafy vegetables for <5 days/week (35.8%) were identified as other frequently related risk factors in young MI patients. (Table 3)

One fifth (20.8%) cases were found having clustering of one or two risk factors. Maximum numbers of patients (66%) were having clustering of three to five risk factors. (Table 4)

Discussion:

Coronary Artery Diseases (CAD) in India is not only tolling country's economy by the mean of lifelong medications and incidental admissions plus interventions but also affecting physically and mentally productive age group having responsibly of family and at workplace. Risk factors involved in premature MI are different from that of old MI cases and so are the preventive measures.

Present study reported two youngest cases at the age of 24 years with mean age 40.08 years. Few other studies also reported MI cases at younger age of 22 years.^[17,18] Other Gujarat based studies reported mean age of young MI cases as 35 years.^[19,20] Lower mean age in these studies was because of lower cut-off age (<40 years) in defining young MI case. It is also found in present study that 19.8% cases were as young as below 35 years of age.

The study found male preponderance having 88.7% male cases. Male: Female ratio was found as high as 7.8:1 in present study. In previous studies the gender distribution of young MI in men reported to be between 72-99%.^[17-19,21,22]

Table 3: Risk factor profile of young MI cases

Risk factor	Frequency (%)
Family history of myocardial infarction Present	28 (26.4)
Hypertension Present	5 (4.7)
Diabetes Mellitus Present	5 (4.7)
Tobacco consumption Present	65 (61.3)
Alcohol consumption Present	9 (8.5)
History of oral contraceptive pills use Present*	7 (58.3)
Sedentary life-style Present	73 (68.9)
Green leafy vegetable consumption <5 days/week	38 (35.8)
Fruit consumption <5 days/week	9 (8.5)
Acute life event during last year Present	21 (19.8)
Type of personality Type A	33 (31.1)
Body Mass Index (BMI) BMI \geq 25 kg/m ²	19 (17.9)
Waist : Hip(W:H) ratio \geq 0.90 for male and \geq 0.85 for female	49 (46.2)

*only female cases considered in denominator (n=12)

Table 4: Clustering of different risk factors among young myocardial infarction cases

Number of risk factors	Frequency (%)	Cumulative frequency (%)
1	4 (3.8)	4 (3.8)
2	18 (17.0)	22 (20.8)
3	30 (28.3)	52 (49.1)
4	23 (21.7)	75 (70.8)
5	17 (16.0)	92 (86.8)
6	11 (10.4)	103 (97.2)
7	1 (0.9)	104 (98.1)
8	2 (1.9)	106 (100.0)

Frequency distribution revealed that demographically more number of cases was noted from urban area (74.5%), literates (85.8%), upper socio-economic class (54.7%) and joint family (60.4%). North India based study at tertiary care centre reported 71% cases from rural area. It was because the hospital was rural area based tertiary care centre.^[21] It also noticed that 105 (99.1%) cases were married persons and the finding is consistent with our study. Our study reported 52.8% manual labourer cases which were higher than 34% cases reported in North India based study. The probable reason is using different classification of occupational divisions by the study.^[21]

Family history of CAD among first degree blood relatives was present in about one fourth (26.4%) patients. Other Gujarat based studies from Bhavnagar and Ahmedabad reported positive family history of

CAD in 13% and 19% cases respectively.^[19,20] Lower number of positive family history in Bhavnagar based study would be because of limited sample size of 30 cases.

Tobacco consumption is an important independent risk factor for CAD in young adults. Tobacco consumption was found to be as high as 61.3% among cases. Similar finding (58.7%) was noted by Mukherjee et al.^[23] Narang et al. found 88.24% young MI cases having habit of tobacco consumption.^[21] In same North India based study they found 70.58% cases taking alcohol while alcohol use as we found in our study was only in 8.5% cases. Status of Gujarat being dry state and alcohol consumption banned by law could be reason for same.

Among female cases out of total 12 more than half (58.3%) gave the history of OC pills usage. OC pills use is considered as one among the risk factors most of the studies done on MI of all ages. But two studies done on young MI cases showed none of the participant was using OC pills.^[19,24] Socio-demographic and cultural background could be the possible reason behind it.

High blood pressure and high blood sugars are key determinants and proven risk factors of MI. In present study out of 106 cases only 5 (4.7%) reported hypertension and same number of patients were found to be diabetics. Similar findings were found in Pakistan based study having 6.6% hypertensive and 3.3% diabetic cases in young MI.^[24] Gupta et al. reported higher number of young MI cases having hypertension (33%) and diabetes (37%).^[19] Gujarat based study reported 16% hypertensive and 11% diabetic.^[20] Narang et al. also reported 11.76% hypertensive and 23.53% diabetic in their study.^[21] Kolkata based study also reported 24% diabetic and 18% hypertensive.^[20]

Sedentary life style was found in 68.9% cases. Considering active and productive younger population group this figure is quiet significant. Other study also supported the finding having significant number of cases with sedentary life style.^[19] With higher W:H ratio 46.2% cases found obese. Obesity among young MI using BMI criteria was as low as

17.9% only. This clearly indicates central obesity is more important risk factor than higher BMI.

Stressful life condition in term of occurrence of any acute life event in past one year was present in 19.8% cases. Narang et al. too in their study found insignificant number of cases (11.77%) having role of stress as risk factor.^[21]

In UK based prospective analysis by Crowe et al. showed that risk of MI is 32% less among vegetarians.^[25] In present study we found that inclusion of fruits and green leafy vegetables in regular diet as protective food were missing in 8.5% and 35.8% cases respectively. In Saurashtra region as a cultural practise vegetarian diet is predominant one. The families having predominant non-vegetarian diet are less in number. So other factors might be playing role as a risk factors.

In our study 4 (3.8%) young MI cases were having only one risk factor and that was the male gender. It indicates occurrence of MI at younger age even without any established known risk factors. Pakistan based study showed only 1 (0.01%) case had single risk factor.^[24] we found 50% cases having clustering of more than 3 risk factors. Similar findings were suggested in study by Akhtar et al.^[26]

Conclusion:

Male gender, tobacco consumption, sedentary life-style and obesity are the major risk factors associated with CAD in younger age. Patients below the age of 30 years are also reported which indicates need of attention even before the age of 30 years. Very few persons were having hypertension and diabetes at younger age which indicates the likely chances of missing attention to other risk factors and life style modifications. Except male gender and family history of MI all the frequently associated risk factors like tobacco consumption, sedentary life style and obesity are well modifiable risk factors in this particular age group.

Recommendations:

Screening at younger age not only for high blood pressure and high sugar level but also for early warning sign and symptoms should be done. Non-sedentary life style with obesity prevention and

tobacco free youth should be given more importance at younger age and must be addressed as primordial and primary prevention agenda.

Limitations:

The study included only one tertiary care unit which can pose a problem of selection bias. This study is a descriptive study with frequency analysis only, comparative studies can help more in determining level of significance for any particular risk factor.

Declaration:

Funding: Nil

Conflict of Interest: Nil

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Role of CB-NAAT in Diagnosis of Mycobacterial Tuberculosis and Rifampicin Resistance among Key Population under Programmatic Condition in Gujarat, India

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Abstract :

Introduction : India is the country with the highest burden of TB infection. The World Health Organization has endorsed the Gene Xpert MTB/RIF assay for rapid detection of tuberculosis with rifampicin resistance. Testing specimens with CB-NAAT can detect pauci bacillary mycobacterial tuberculosis which is potentially contribute to microbiological confirmation of tuberculosis. Diagnosing tuberculosis (TB) in people living with HIV/AIDS (PLHIV), paediatric age group and extrapulmonary samples is challenging as microscopy is negative due to low bacillary load. TB culture is a slow method which takes 2-6 weeks for growth of the mycobacteria. **Objective :** To assess the the role of Cartridge based nucleic acid amplification test (CBNAAT) to diagnose TB and rifampicin resistance in PLHIV, paediatric age group and extrapulmonary samples. **Method :** The study is based on the secondary analysis of data derived from testing by Xpert MTB/RIF testing among presumptive TB cases of HIV/AIDS (PLHIV), paediatric age group and extrapulmonary samples in Gujarat. Under this study, 28,304 presumptive TB cases of HIV/AIDS (PLHIV), paediatric age group and extrapulmonary samples were tested between January to September 2019. **Results:** Overall, 1,40,177 specimens were tested, of which 10,018 (7.14%) samples were PLHIV presumptive TB, 7,380 (5.26%) samples were Paediatric Presumptive TB and 10,906 (7.78%) samples were extrapulmonary Presumptive TB. These 28,304 presumptive cases, in 3994 (14.11%) cases TB detected. Out of these 3994 TB detected cases, 1068 were PLHIV Presumptive TB, 724 were paediatric presumptive TB and 1987 were extrapulmonary presumptive TB. Total 2220 rifampicin resistant TB cases were detected from January 2019 to September 2019, of which 288 (10.27%) were rifampicin resistant TB in key population. Out of these 288 rifampicin resistant TB cases 63 were PLHIV Presumptive TB, 47 were paediatric presumptive TB and 178 were extrapulmonary presumptive TB cases. **Conclusion :** CBNAAT has advantages of rapid case detection bacteriologically confirmed TB in less than 2 hours and simultaneously detecting rifampicin resistance in PLHIV, paediatric age group and extrapulmonary samples in which bacillary load is very low.

Key Words : CBNAAT, Key population, Paediatric Extrapulmonary, PLHIV, Presumptive tuberculosis

Introduction :

Tuberculosis is the commonest infectious disease caused by Mycobacterium tuberculosis complex worldwide. Worldwide, TB is one of the top 10 causes of death and the leading cause from a single infectious agent (above HIV/AIDS). Millions of people continue to fall sick with TB each year. According to global tuberculosis 2018 WHO reports, 100 lakhs newly

detected cases and 13 lakhs death due to tuberculosis.[1] It is estimated that approximately 70 million people die from tuberculosis within 20 years and it is because of inadequate measures for TB control. [2] Standard sputum based diagnostic methods to detect pulmonary tuberculosis include sputum microscopy and culture. However in Key population like PLHIV, Paediatric patients and extrapulmonary infection due to paucibacillary

condition of mycobacterial Tb , microscopy is very less sensitive and specific diagnostic tool.

To overcome these problems, sputum culture and sensitivity for Mycobacterial Tb can be used but this technique is usually takes 4 to 8 weeks , and not cost effective for screening purpose. This delays initiation of anti-tuberculosis treatment leads to transmission of Tb in the community and increase risk of spread of pulmonary Tb to extrapulmonary site. CBNAAT is automated cartridge based nucleic acid amplification test assay, having integrated and automated amplification and detection using real time PCR, provide result within 2 hours. It is highly specific test as it uses 5 unique molecular probes to target rpoB gene of M. Tuberculosis which detect M. Tuberculosis and rifampicin resistance.

Diagnosis is often difficult because of low number of bacilli and scanty sputum production due to lack of caseous necrosis in PLHIV, Difficult to collect sputum sample in children and collection of extrapulmonary sample is the major challenge

Objective :

This study was carried out to evaluate role of CBNAAT in early diagnosis of TB and rifampicin resistance in key population like PLHIV, Paediatric and extrapulmonary samples .

Method :

Study Design : This study was a secondary analysis

Study participants : Samples from of presumptive TB cases of HIV/AIDS (PLHIV) , paediatric age group and extrapulmonary patients

Study Duration: Samples received from January to September 2019.

Study site: Data collected from 60 CBNAAT sites across the Gujarat state, India.

Sample Collection: For PLHIV patients sputum samples and in pediatric age group sputum or gastric lavage collected with complain of cough more than 2weeks / weight loss /low grade fever or X-ray suggestive of pulmonary tuberculosis/ history of contact with infectious TB cases and extrapulmonary cases organ specific samples like Pus, Lymphnode, Pleural fluid, CSF, Ascitic fluid, synovial fluid ,bone etc. were collected. These all samples were tested upfront

in CBNAAT. From collected sample 1 ml was separated in sterile container and was analyzed by CBNAAT on Xpert MTB/RIF manufactured by Cepheid, endorse by WHO(2010).The sample was diluted with three times the reagent ,incubated at room temperature for 15 minutes and loaded cartridge in to the CBNAAT machine for automated analysis with result within 2 hours. CBNAAT machine will detect mycobacterial tuberculosis complex and rifampicin resistance simultaneously.

Data analysis: Data was analysed using Microsoft Excel.

Results:

Overall, New TB diagnosis(Smear+ve/-ve), Contact of MDR/RR TB patients , Follow up patients whose Smear +ve, HIV TB co-infected ,private sector and Presumptive Tuberculosis etc. total 1,40,177 specimens were tested for tuberculosis in CBNAAT.

Upfront CBNAAT testing in 28304 samples were done in presumptive TB cases in PLHIV , Paediatric and Extrapulmonary patients .10,018(7.14%) samples were PLHIV presumptive TB , 7,380 (5.26%)samples were Paediatric Presumptive TB and 10,906(7.78%) samples were extrapulmonary Presumptive TB.

CBNAAT diagnosed tuberculosis complex in 3994(14.11%) patients of total 28304 presumptive tuberculosis samples . out of these 3994 diagnosed presumptive case 1068 were PLHIV Presumptive TB ,724 were Paediatric Presumptive TB ,2202 were EP Presumptive TB. **(Table 1)**

In these 3994 mycobacterium complex detected presumptive case 288(7.21%) were rifampicin resistant. Out of 288 rifampicin resistant mycobacterium tuberculosis complex 63 cases were presumptive PLHIV ,47 were presumptive paediatric, 178 were extrapulmonary cases. Which indicating that in key population 5.90% , 6.49% , 8.08 % rifampicin resistance detected in PLHIV , Pediatric and extrapulmonary cases respectively. (Table 2)

Discussion :

Upfront CBNAAT testing was offered to all presumptive TB cases in defined 60 CBNAAT laboratory in Gujarat. Participating providers were linked through rapid specimen transportation linkages and rapid result reporting mechanisms.

Table 1: Mycobacterium complex detection by upfront CBNAAT testing in key population

Presumptive Tb Cases	Samples tested for CBNAAT	Mycobacterium complex present by CBNAAT	Mycobacterium complex absent by CBNAAT	Invalid / errors in results
PLHIV Presumptive TB	10,018	1068(10.66%)	8806(87.90%)	144(1.43%)
Paediatric Presumptive TB	7,380	724(9.81%)	6569(89.01%)	87(1.17%)
Extrapulmonary Presumptive TB	10,906	2202(20.19%)	8595(78.81%)	109(0.99%)
TOTAL	28,304	3994(14.11%)	23970(84.69%)	340(1.20%)

Table 2: Rifampicin resistance detected by upfront CBNAAT key population

Presumptive Tb Cases	Mycobacterium complex detected by CBNAAT	Rifampicin resistance detected
PLHIV Presumptive TB	1068	63 (5.90%)
Paediatric Presumptive TB	724	47 (6.49%)
Extrapulmonary Presumptive TB	2202	178 (8.08 %)
TOTAL	3994	288(7.21%)

CBNAAT testing was extended to non-sputum specimen under routine programmatic conditions in India, in line with the recent WHO recommendations^[3] This led to overall improvement in bacteriologically confirmed TB cases, as well as detection of significant numbers of rifampicin resistant TB cases in presumptive TB cases. All the TB cases diagnosed under the project were notified under RNTCP irrespective of type of referring provider.

Smear microscopy for AFB is simple ,economical and easy to test for diagnosis of tuberculosis. However, it needs at least 10,000 bacilli per ml to give a positive result and being highly subjective (operator dependent) test. Its sensitivity has been shown to range from 20 to 60% under different condition.⁽⁴⁾ This sensitivity is further decrease in PLHIV due to lower rates of caseous necrosis and sputum production which leads to paucibacilli in sputum⁽⁵⁾ For children specimens like gastric lavage and induced sputum is difficult which indicate that presumptive TB and DR Tb in childrens may be underdiagnosed. Current World Health Organization guidelines advise that all children <5 years of age who are in close contact with sputum smear positive index patient should be actively traced , screened for TB and provided preventive chemotherapy after active TB

has been excluded.⁽⁶⁾ And extrapulmoary samples due to low number of bacilli , its challenging to diagnose Tb by direct Zn smear microscopy. Utilization of upfront use of CBNAAT in these key population improve bacteriological confirm cases of tuberculosis with Rifampicin susceptibility.

CBNAAT performance on both sputum and non-sputum was found to be highly satisfactory, with overall 98.80% cases getting valid results. These findings are similar to other studies conducted on CBNAAT assay on sputum and non-sputum specimens^[7-12]. Polymerase chain reaction inhibition leading to invalid test results is a major concern while testing specimens on various types of molecular assays, especially non-sputum specimen^[13-15] Invalid or false negative results in various PCR based tests are mostly due to the presence of inhibitors, sub-optimal assay conditions or omission of key steps [16]However, this issue was seen to be of lesser concern on CBNAAT due to automation and self contained test which offers minimal manual manipulation of samples which is leading to low PCR inhibition rates.

NeerajRaizada1*et al study indicating 6.3 % and 8.10 % M.Tb detection and Rifampicin resistanace in

pediatric age group with presumptive tuberculosis which is similar to our study.⁽¹⁷⁾ This is indicating that by offering upfront CBNAAT to presumptive case we can diagnose M.Tb with resistance of rifampicin. Pediatric case of tuberculosis is directly related to contact of Tb patient so by diagnosing Tb in pediatric case we can trace tuberculosis in adult also. We should focus contact tracing on pediatric tuberculosis.

Lesley Erica Scott et al study on Extra pulmonary samples, incidence of 22.13% M.tb in extra pulmonary samples of which 9.6% were Rifampicin resistant which is similar to our study.⁽¹⁸⁾ Providing upfront CBNAAT to extrapulmonary samples reduce diagnostic delay and provide microbiological confirm report to clinician.

According to 2019 global report total of 4,77,461 TB cases among HIV-positive people were reported till 2018. In 2018, globally 937,500 cases were newly enrolled in HIV care, out of these 79,285 notified as TB case. In India 29,766 cases were noted as new TB HIV co-infected cases.⁽¹⁹⁾ TB is the leading cause of death among people living with HIV. Persons co-infected with TB and HIV are more likely to develop active TB disease than persons without HIV infection.⁽²⁰⁾ Neeraj Raizada et al published article in 2015, Enhancing TB & DR-TB Detection by proving proving Upfront Xpert MTB/RIF Testing for people living with HIV in India which shows 28% detection of M.Tb and in these detected cases 9.5% were Rifampicin resistant.⁽²¹⁾ These data shows detection of Tuberculosis and rifampicin resistant is higher compare to our study in which 10.66% were M.Tb detected and 5.9% were rifampicin resistance in presumptive Tb in PLHIV. This may be due to geographical variation of study conducted in India. As HIV related immune-suppression increases, the clinical pattern of TB disease changes, with increasing numbers of smear-negative and extra pulmonary cases⁽²²⁾

Sputum smears tend to be negative, as tubercle bacilli do not appear in sputum because of the paucity of pulmonary inflammation at early onset of disease and decreased cavitation. Further, though TB is the most common opportunistic infection among PLHIV, clinical decision-making is complicated because HIV

infection broadens the

scope of differential diagnosis of smear-negative pulmonary TB to include diseases such as

Pneumocystis carinii pneumonia (PCP), pulmonary Kaposi's sarcoma, and Gram-negative bacteremia⁽²³⁾

Furthermore, up to one third of HIV-TB co-infected cases might have completely normal chest radiographs due to less cavitation leading to increased chances of under diagnosis or missed diagnosis of TB in such cases⁽²⁴⁾. Culture of sputum for M. tuberculosis though considered as the gold standard, is difficult to use and in resource-limited settings challenging to implement⁽²⁵⁾ Culture result provided after 2–8 weeks are not available to guide immediate treatment decision-making needs⁽²⁶⁾ Capacity of CBNAAT is to diagnose 131 cfu/ml TB bacilli and Rifampicin resistance in one cartridge so that it is promising tool for diagnosis of TB in PLHIV and starting early treatment.

Conclusion:

CBNAAT has advantages of rapid case detection bacteriologically confirmed TB in less than 2 hours and simultaneously detecting rifampicin resistance in key population like PLHIV, paediatric age group and extrapulmonary samples in which bacillary load is very low. This rapid turn around time of CBNAAT will helpful to start early treatment under field conditions. Upfront CBNAAT, leading to overall strengthening of care and support package for PLHIV, Pediatric group and Extrapulmonary presumptive Tuberculosis diagnosis under programmatic condition.

Declaration:

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Conflict of interests: Nil

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Remedial Education in Medical Schools: Students' Perspective

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WHAT PROBLEM WAS ADDRESSED?

Remedial education is a multifaceted approach, tailoring remedial intervention plan to a student's specific needs. Evidence shows that six to fifteen percent of medical students experience academic difficulties and these percentages are increasing.¹ Poor academic performance can result in student's dropping out of professional programs while still being responsible for the large debts incurred. Identifying students' specific needs regarding remedial approaches seems imperative as a first step to any possible intervention.

WHAT WAS TRIED?

Focus Group Discussions (FGD) to understand students' perceived need for remediation, causes of low performance and potential solutions was utilized. Two FGDs (9 participants each) with undergraduate medical students who had failed a summative examination of a school in India, were conducted by a skilled investigator (faculty) and two note keepers, in 2018 using a semi-structured guideline. Prior informed oral consent and confidentiality were ensured. The discussion lasted for ninety minutes and was not audio-taped. The notes were expanded within 24 hrs and emerging themes were analyzed qualitatively.

Nonacademic problems contributing to low performance included; medium of instruction being English, adjustment to life outside home, lack of self-confidence, motivation and concentration, lack of mentor support, personal health, sleep problems, intake of healthy diet and spending too much time on cell phones and social media. One student said "I am from Gujarati medium school, it is difficult for me to understand and write in English". Academic problems included; managing study time, inability to plan and retain what is studied, inability to pick out what is important and what to write in exams, difficulty in coping with large amount of content, need for guidance regarding text books and exam anxiety. One of the students said "I am not able to complete question paper in time and often fail in exam". The identified learning needs included; a revision class-, an extra revision exam, a practice on exam question writing skills, peer support and need of mentor. A student opined "Revision classes,

say three to four before the summative exam would help me"

WHAT LESSONS WERE LEARNED?

Qualitative method such as FGD appears to be a promising tool to improve teaching and training students. An optimal system of remediation should begin with incorporating students' perceptions and strategies to help students develop better approaches to academics. FGDs to obtain additional information on variables like; their attendance in class, whether they joined medical school by choice/ pressure, whether they realized the quantum of studies required before joining. Considering the fact they are top scorers in the qualifying exam, academic constraints should be minimum. Meanwhile, findings from the study were shared with the faculties and remedial approaches in form of mentoring to facilitate self-directed learning, revision classes and assessments for learning are planned to be implemented.

Foundation Course² a one-month long program to orient medical learners to MBBS course and provide them with requisite knowledge, communication, technical and language skills is run under the recent competency-based curriculum reforms in the form of GMR 2019³ for undergraduate medical curriculum. This revised curriculum is implemented by all medical colleges under the ambit of Medical Council of India from August 2019. If this program is found to be successful, it might address many problems faced by students from diverse educational streams and backgrounds in terms of geography, culture, language, economy, social construct, medium of instruction and education boards to transition appropriately from school to professional course and is likely to address problems of low performance in students.

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Book : Smith GDL. Chronic ear disease. Edinburgh: Churchill Livingstone; 1980.

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