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Volume 12 Issue 1 (January-March 2021)

## **INDEX** Page No. Editorial **Communication in Health - A Challenge Original Articles** A Study on Socio-Demographic, Clinical Profile and Outcome of Breast Cancer Patients attending **Tertiary Cancer Care centre in Gujarat State** Anand Shah, Ravi Patel, Jayesh Solanki, Vaishali Ravani......05 Proportion of Osteoarthritis Knee among Older Adults Presenting with Knee Complaints as Assessed Using American College of Rheumatology (ACR) Criteria at a Tertiary Care Hospital, Kollam Health Status of School Going Children: A Cross Sectional Study in Urban Area of Jhalawar District, Rajasthan An Epidemiological Study to Assess Prevalence and Risk factors Associated with Diabetes among Adolescents in Urban Areas of Udaipur Mitin Parmar, Gourav Kumar Goyal, Kalika Gupta, Milan Chaudhary ......22 The Social Capital among Elderly Population of Chandigarh: Cross Sectional Study Kiranjit Kaur, Naveen Krishan Goel, Manoj Kumar Sharma, Navpreet Singh, Mamta Bishnoi, Social Media Use and its Association with Sexual Practices among Undergraduate Students in a Private Medical University at Solan, Himachal Pradesh

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## **INDEX**

Content Page No.
Comparison of Predictors of Mortality between Young and Elder Covid-19 Patients Admitted in Covid- 19 Designated Tertiary Care Hospital
Sonal Shah, Manisha Kapdi, Jyoti Vora, Kuldeep Joshi, Pratik Patel, Sandip Malhan
A Cross-Sectional Study on Prevalence and Socio-Demographic Correlates of Hypertension in Peri-urban Community of Kashmir Valley
Uroosa Farooq Allaqband, Anjum B Fazili, Rohul Jabeen Shah and Javeed Ahmad Parray55
Short Communications
Overweight and Obesity among Primary School Going Children in Urban Agra: A Cross-Sectional Study
Iqbal Aqeel Khan, Geetu Singh, Kunver Viresh Singh63
Knowledge and Perception about Risk Factors and Symptoms of Cervical Cancer in Female Teachers of Government and Private Schools of Chandigarh
Aprajita Singla, N K Goel, Suman Mor, Meenu Kalia70
Evaluation of Depression among Medical Students of Gujarat during COVID-19 Pandemic

#### **Communication in Health - A Challenge**

#### Vihang Mazumdar

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The recent discussion nationally on vaccine hesitancy and reluctance to follow Covid appropriate behaviour has once again brought focus on how communication in health has remained a challenge after all these years. Why haven't we convinced mothers to wash hands and use fluids available at home for diarrhoea prevention? Why do doctors fail to give proper advice to patients even for their own prescription? Why aren't proper instructions given while dispensing IFA? Why are the four key messages not given by health workers during vaccination?

One common thread runs through all these: lack of communication.

It becomes difficult to comprehend why and how we fail considering that on one hand "unlimited talktime" is an absolute must for us and yet we are very reticent when it comes to communicating where it matters. On one hand we see the all pervasiveness of products like noodles and on the other we fail to convince mothers to give exclusive breast feeding and complementary feeding with the same success.

Over the years the jargon used, health literacy, health awareness, health education, mass media communication, advocacy, counselling, interpersonal communication, behaviour change communication to social and behaviour change communication has changed. What remains constant is the fact that unsolicited advice is not welcome.

In the triad of Message, Medium and Messenger the messages are often bland, having to conform to scientific and political correctness; the varieties of media are ever expanding with their own requirements as to the format of messages. Finally the huge impact of the messenger cannot be underestimated.

Let us for a moment dwell upon the issue of vaccine hesitancy. While everyone expected the vaccine to be welcomed with open arms, a contrary response was met with much chagrin. If the vaccine was presented after a few weeks after adequate data regarding safety and efficacy was made available in public domain. The details of vaccine been communicated by competent authority. A time window announced for availability of vaccine for health professionals. Would the response have been different? Perhaps... Sometimes a very aggressive sales pitch makes a client wary. Social media also had an immense role in vitiating the atmosphere. Inherently, people are more receptive to bad news. Any negative report, without confirming veracity or authenticity of source is lapped up with an "Aha! The crime has been exposed!" and promptly forwarded to a large number of equally gullible folks.

The messenger challenge is a difficult one to overcome. Looking at the recent experiences of MR (Measle-Rubella) and Rota vaccine campaigns, traditional models of local leaders, religious leaders, etc. did not give equal dividends in rural and urban areas. Lack of success of local leaders in getting day to day problems solved may be the reason urban population was not inspired to follow his/her appeals.

The celebrity endorsement option also at times may follow the law of diminishing returns. While in

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early days "Do boond zindagi ke" struck a chord, messages during later campaigns did not get the same response as they got lost among many messages by the same person selling hair oil, gold loans, jewellery and many more products. I would be as likely to get my child vaccinated in response to that message as I would be likely to buy the hair oil.

Therefore the challenge for us is to seek new avenues to engage with people such that there is credibility and higher acceptance. I feel, especially for urban areas, that the extinction of the once common species of "MBBS family doctor" has created a void as a link between the health authorities and people. As a guide, philosopher and friend who knew and understood the needs of the family, he/she was ideally placed as a reliable and credible source to endorse something.

Once upon a time (and even now) KAP (Knowledge, Attitude and Practice) studies were the bread and butter of every resident attending a conference. Every postgraduate has written a very elaborate plan to create awareness (and even perhaps eliminate) a myriad of health issues in their examination papers and assignments, now the time has come to put them to test, to explore new ideas to create awareness regarding health issues and create the impact they deserve.

## A Study on Socio Demographic, Clinical Profile and Outcome of Breast Cancer Patients attending Tertiary Cancer Care centre in Gujarat State

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#### Abstract:

**Introduction:** Breast cancer is second most common cancer all over the world. Majority of breast cancer cases are registered to hospital at a later stage of cancer presentation. **Objective:** To study sociodemographic, clinical presentation and outcome of Breast cancer patients attending tertiary care centre of Gujarat state. **Method:** This was a retrospective study made up of 5774 patients registered in tertiary care centre of Gujarat state. Data including patient's socio-demographic information like age, marital status, education level and clinical diagnosis including clinical presentation at time of registration, treatment history etc was collected. The data was analysed using MS office 2010 and Epi Info software version 7.0. **Results :** The age ranged between 17-99 years, with a median of 50 years and interquartile range of 42-58 years. There were 62.07% patients presented with locally advanced breast cancer, while 17.57% patients had distant metastasis at diagnosis. Significant association (p<0.05) was found between presentation of disease and literacy status. The overall Kaplan-Meier survival rate at 5 years was 35.8% + 5.0%. Survival rate was consistently declining with increase in clinical extension of disease. **Conclusion:** Majority of patients were in early advanced stage during their first hospital visit which was associated with poor survival. This information may help authorities to focus on early diagnosis of breast cancer.

Key words: Breast cancer, Clinical profile, Socio-Demographic Profile

#### Introduction:

Breast cancer is second most common cancer all over the world and is one of the leading cancer among women.<sup>[1]</sup>It has high prevalence rate in developed as well as developing nations. In 2018, there were estimated over 2 million breast cancer cases.<sup>[2]</sup>

Its incidence is rising rapidly in developing world due to change in life style, urbanization, increased life expectancy and influence of western lifestyles. By few preventive approach, risk of breast cancer can be reduced but still this has been inefficient in reducing its incidence in developing countries, as majority of cases are diagnosed at very late stage.<sup>[1]</sup>

Even in India, Breast cancer is the most common cancer among females. As per 2012 statistics report, there has been huge surge in Breast Cancer cases in India, it has been most common cancer among females, both in rural and urban areas. In majority of Indian cities, breast cancer has accounted for 25% -32% of overall cancer cases among females.<sup>[3]</sup> It is expected that every 4 minutes, a new breast cancer case is reported. As per 2018 breast cancer statistics report, 1,62,468 new cases were registered and 87,090 deaths were registered due to breast cancer.<sup>[4]</sup>

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As per Hospital Based Cancer Registry (HBCR) report, the 5 year survival of breast cancer patients is not even 60% in India, as majority of cases visit hospital in late stages.<sup>[3]</sup> Aim of this study is to evaluate socio-demographic profile, clinical stage of cancer and outcome of breast cancer patients visiting tertiary care centre.

#### Method:

A retrospective study of 5774 breast cancer patients visiting tertiary care centre of Gujarat state was carried out. All available case notes and treatment records of cancer patients attended hospital from 2014 to 2016 were retrieved from the Medical Records Department of the hospital. Data including patient's socio-demographic information like age, sex, marital status, education level and clinical diagnosis including clinical extent at time of registration which is equivalent to tumour stage, date of last follow up, death (if any) etc. was included in the study.

Data Capturing: The institute has Indian Council of Medical Research designated Hospital based cancer registry from 2014 with a dedicated data entry operators and medico social workers. Files of confirmed malignancy cases were requisitioned from the medical records department. Social workers were trained by an oncologist for identifying and capturing the relevant patient details. These patient's social and medical parameters were extracted from the file including the clinical notes and radiological imaging records. Data on clinical extent of disease were based on clinical assessment before treatment. The criteria used for coding the clinical extent of disease are as per cancer staging in National Cancer Institute (NCI)<sup>[5]</sup> and are hence standardized. They were as follows:

Localized disease - Cancer is limited to the place where it started, with no sign that it has spread; regional-Cancer has spread to nearby lymph nodes, tissues, or organs.

Distant metastasis - Cancer has spread to distant parts of the body. Staging details were verified by an oncologist before entering the data. Patients who could not come for follow-up visits were contacted telephonically to ascertain the current status of the patient's malignancy. In case of no response to the first call, a second phone call was made after a few days. In case of no response to the second phone call, the patient was deemed lost on follow up.

#### **Data Analysis**

Patients' baseline characteristics, disease related factors have summarized using descriptive statistics. The categorical parameters have compared using chi-square test. Survival analysis was performed. Occurrence of death was considered as event and 5 year survival curve was calculated using Kaplan-Meier method. All the analysis was performed using MS office 2010 and Epi Info software version 7.0. Prior permission from institutional Scientific Review Committee (SRC) and Ethics committee (EC) was sought before starting the study.

#### **Results:**

Out of 5774 patients, majority (32.66%) of patients belong to 41-50 years age group. Median age of patient was 50 years with interquartile range of 42-58 years and range of 17-99 years. 3.8 % breast cancer cases were seen in male patients. 88.14% of study population were following Hindu religion. Around 47% of study population were illiterate, followed by primary education in 29.78%. Only 8.05% of study population had studied diploma or degree courses. Majority of patients were from rural area (79.32%) (Table 1)

All the patients of breast cancer were classified as per clinical extension of cancer at the time of registration. As per table 2, it was found that, 62.07% of patients presented with Regional spread. Cancer was localised in 20.35% cases. Breast cancer was presented in left side of breast in 49.03% and right side presentation was seen in 48.13%.Outcome of patient was considered as per last hospital follow up or telephonic follow-up of registered patients. We could get follow up information of 3705 patients, out of which

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#### Table 1: Socio demographic characteristic of study population

Variables	Frequency	Percentage		
Age Category	(Years)			
< 30	229	3.97		
31-40	1116	19.33		
41-50	1886	32.66		
51-60	1538	26.64		
> 60	1005	17.41		
Total	5774	100		
Gende	r			
Female	5555	96.21		
Male	219	3.79		
Total	5774	100		
Marital St	atus			
Married	4899	84.85		
Other	875	15.15		
Total	5774	100		
Religio	n			
Hindu	5089	88.14		
Others	685	11.86		
Total	5774	100		
Educatio	on			
Illiterate	2672	47.34		
Primary	1681	29.78		
Secondary & Higher Secondary	830	14.70		
Degree/Diploma	461	8.16		
Total	5644*	100		
Location				
Urban	1194	20.68		
Rural	4580	79.32		
Total	5774	100		

\*Available information was considered for analysis mortality proportion was 42.9%.

There was association between clinical stage of at 1<sup>st</sup> hospital visit and patient's educational status. Proportion of patients having localised tumour was more in literate patients than illiterate. (Table 3)

We considered only 3705 patients for calculating survival curve as outcome was known only for these

#### Table 2: Clinical presentation of study cases

Variables	Frequency	Percentage		
Clinical extension	n of disease	e		
Localised	513	20.35		
Regional	1565	62.07		
Distant	443	17.57		
Total	2521*	100.00		
Laterality				
Right	2745	48.13		
Left	2816	49.03		
Bilateral	142	2.4		
Total	5703*	100.00		
Outcome				
Death	1589	42.9		
Alive	2116	57.1		
Total	3705*	100.00		

\*Available information was considered for analysis

patients. Deaths were considered as events and 5 year survival curve was calculated for different clinical staging of cancer as per clinical extension of disease. As shown in Figure 1, cumulative survival was shown on Y axis and months of survival was shown on X axis. As per Kaplan Meier curve, localised breast cancer patients were having 5 year survival rate of  $60.5 \pm 10.1$  %, whereas it was  $42.4\% \pm 6.9\%$  in regional cancer cases. For, Distant Metastatic cancer cases had five year survival rate was  $7 \% \pm 6.4\%$ . Overall 5 year survival rate was  $35.8\% \pm 5\%$ .

#### **Discussion**:

Morbidity and mortality from breast cancer has reached at concern level at globally. In this study, five thousand seven hundred and seventy-four patients were recruited and the peak age of occurrence was between 41-50 years, median age was 50 years with interquartile range of 42-58 years and range of 17-99 years. Patients younger than 30 years contributed 4% of breast cancer to the study population (Table 1). This finding corroborated with other studies. In study done by Oludare Folajimi Adeyemi et al (2018)<sup>[6]</sup> peak age of occurrence was between 41-50 years age group, age range of 23 to 83 years and mean

Educational loval	Clinica			
Euucational level	Localised	Regional	Distant	Chi-
Illiterate	232 (18%)	779 (61%)	261 (21%)	square = 18
Primary	162 (22%)	458 (63%)	111 (15%)	n < 0.05
Secondary & Higher Secondary	71 (23%)	192 (63%)	41 (14%)	p < 0.05
Degree/Diploma	35 (23%)	93 (62%)	23 (15%)	

 Table 3: Association between educational level and clinical extent of disease

Figure 1: Five year survival curve as per clinical extent of breast cancer



age of 49 years. Mohite RV et al (2015)<sup>[7]</sup> found that maximum cases were in age group 40 to 60 years with mean age 51.46 (SD 7.16) years and age ranges from 38 to 67 years.

Out of total cases, 5555 (96.21%) were female and 219 (3.79%) were male. About 85% were married. This was consistent with Dr Harsha M. Meshram et al  $(2016)^{[8]}$  and Aleyamma Mathew et al (2018).<sup>[9]</sup>

Out of total cases, 47.37 % cases were illiterate which is high compare with other studies done by Dr. Harsha M. Meshram et al  $(2016)^{[8]}$  and done by Mohite RV et al (2015).<sup>[7]</sup> In our study, 4580 (79.32%) cases were from rural area and 1194 (20.68%) cases

were from urban area. This finding is consistent with Mohite RV et al (2015)<sup>[7]</sup> but Dr. Harsha M. Meshram et al (2016)<sup>[8]</sup> found majority cases from urban area. One of the reason of majority of cases from rural area in our study is that, our institute is the only one tertiary care hospital in Gujarat state.

In our study,1565 (62.07%) patients presented with locally advanced breast cancer, while 443 (17.57%)patients had distant metastasisat diagnosis. In another study done by J. D. Kemfang Ngowa et al (2011)<sup>[10]</sup>, 216 (62.78%) patients hadpresented with locally advanced breast cancer and 28 (8.13%) had metastatic breast cancer. So patients diagnosed with later stages were more in

:: 08 ::

our study. This may be due to lack of awareness about disease because majority of patients were illiterate and we found inverse association between patient's literacy status and clinical stage of disease at time of diagnosis.

Out of total patients, we could know outcome of 3705 patients, among them 1589 (42.9%) cases were died and 2116 (57.1%) were alive.

In our study, we have observed, overall 5 year survival rate as  $35.8\% \pm 5.0\%$ . Survival rate was consistently declining with increase in clinical extension of disease. This finding was consistent with study done by CK Gajalakshmi<sup>[11]</sup> et al where overall 5 year survival rate was 47.5%.

#### **Conclusion:**

This study shows that majority ofpatients were in early advanced stage during first hospital visit. Literate patients were diagnosed in early stage than illiterate. Poor survival was associated with stages at the time of diagnosis. So health authorities must focus on early diagnosis of disease.

#### **Recommendation:**

There is absolute need for increasing health awareness on breast cancer disease, and use of selfbreast examination which can lead to early detection of cancer.

#### Limitation :

As this was a retrospective hospital based study, a larger proportion of the data had to be loss to follow up which is due to the inherent nature of study design. We could consider it as limitation.

#### **Declaration**:

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#### Conflict of Interest: Nil

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## Proportion of Osteoarthritis Knee among Older Adults Presenting with Knee Complaints as Assessed Using American College of Rheumatology (ACR) Criteria at A Tertiary Care Hospital, Kollam

#### Indu D<sup>1</sup>, Asha K P<sup>2</sup>, Manoj Kumar S<sup>3</sup>, Anuja U<sup>4</sup>

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#### Abstract:

**Introduction:** Osteoarthritis is one of the most prevalent musculoskeletal disorders seen as age increases. Among older individuals it leads to persistent complaints, disability and health care consultations. **Objective:** To estimate the proportion of osteoarthritis knee using American College Of Rheumatology (ACR) criteria among older individuals presenting with history of persistent knee complaints in a tertiary care setting. **Method:** A hospital based cross-sectional study was conducted to assess the proportion of osteoarthritis knee among older patients presenting with persistent knee complaints in orthopedic OP of Government Medical College Kollam. A semi-structured questionnaire was used to collect data regarding socio-demographic profile. Assessment of osteoarthritis knee was done Using American College Of Rheumatology (ACR) Criteria. **Results:** The proportion of osteoarthritis in any knee among older adults was found to be 72%, with bilateral osteoarthritis knee seen in 38.5%. Among those affected, 84% were women. Knee pain, presence of crepitus and bony tenderness were the most common findings among those with OA knee. **Conclusion:** The proportion of OA knee was found to be higher among the study population. Older age group and females were more prone to osteoarthritis of knee. An estimate of the burden of OA in older patients will help policy makers in planning public health programs to improve their health condition and quality of life.

Keywords: American College of Rheumatology (ACR) Criteria, Knee joint, Osteoarthritis

#### Introduction:

Osteoarthritis is a chronic progressive musculoskeletal disorder affecting the joints. Worldwide 7% of the global population is affected by osteoarthritis.<sup>[1]</sup> The Global Burden of Disease Study 2019 lists osteoarthritis as the 15th highest cause of years lived with disability (YLDs) worldwide.<sup>[1]</sup> Osteoarthritis was responsible for 2·2% (1·3–4·1) of total global YLDs, accounting for 18.9 million (95% UI 9.57–37.7) global YLDs in 2019. Among these OA knee, hip, hand, and other site contributed 60.9%, 5.5%, 23.5%, and 10.2% of OA YLDs, respectively.<sup>[2]</sup> Among individuals aged 40 years and above, the global prevalence of OA knee was found to be 22.9% (95% CI, 19.8%-26.1%).<sup>[3]</sup> There are an estimated 654.1 (95% CI, 565.6–745.6) million individuals aged 40 years and above with OA knee worldwide in

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2020.<sup>[3]</sup> The prevalence of OA knee among individuals aged 40 years and above in India was estimated to be 28.7%.<sup>[4]</sup> There was variation in the prevalence of OA knee among individual cities, with Agra (35.5%), Bangalore (26.6%), Kolkata (33.7%), Dehradun (27.2%), and Pune (21.7%). <sup>[4]</sup> In kerala the prevalence of knee osteoarthritis among women aged above 40years was 41.6% (95% CI-41.6±1.25%), with 66.2% having bilateral osteoarthritis of the knee joint.<sup>[5]</sup> The prevalence of osteoarthritis increases with age <sup>[6]</sup> and with many Asian countries ageing rapidly its fast becoming a major problem. People above 60 years constitute 13% of Kerala's population as compared to the national figure of 8.2% (Census 2011). Osteoarthritis of knee is most often associated with knee pain<sup>[7]</sup> which affects the quality of life as well as the economic productivity of affected individuals. Even though the cause of osteoarthritis is not fully understood, prevention and early diagnosis is the most effective strategy to prevent further deterioration of this condition. With changes in lifestyle, the prevalence of OA knee has increased considerably over the years. Even though the number of people affected by osteoarthritis has increased, it continues to be neglected among non-communicable diseases. The health concerns of those affected has often been downplayed and is often seen as an inevitable consequence of ageing. Filling the prevailing knowledge gaps in the burden of osteoarthritis, will help to bring about a shift in policy and health care delivery. This is much needed to highlight the importance of public health interventions and health care approaches needed to decrease burden associated with osteoarthritis. This study aims to estimate the burden of osteoarthritis knee among older patients presenting with persistent knee complaints in a tertiary care setting.

#### Method:

A hospital based cross sectional study was conducted in the department of Orthopaedics, Government Medical College Kollam, which is a tertiary care centre in Kollam district of Kerala. The out-patient wing of department of Orthopedics

caters to about 150 to 200 patients daily of which majority are female patients. Patients above 40 years attending the orthopedic outpatient of Government Medical College Kollam, with history of persistent knee complaints for the past 6 months were included in the study. Patients aged above 40 yrs were included as increase in age increases the risk of degenerative musculoskeletal changes.<sup>[18]</sup> The Zoetermeer survey by Van Saase et al<sup>[19]</sup> showed an increase in prevalence of OA knee with the onset of forties. Patients not giving consent and those with history of trauma, fracture or rheumatoid arthritis were excluded from the study. Based on a study by Chandra Prakash Pal et  $al^{[8]}$  the prevalence of OA knee was found to be 28.7%. Applying in  $n=(Z_{1,\alpha}/2)^2 PQ/d^2$ and considering an alpha error of 5%, absolute precision 7% and non-response rate of 10%, the sample size was fixed at 200. All consecutive patients who met the eligibility criteria and gave consent were included in the study till the required sample size was met. Details regarding their demographic profile like age, gender, education, occupation and presenting complaints were collected using a semi-structured interviewer administered questionnaire. American College of Rheumatology (ACR) criteria was used to diagnose OA knee.

American College of Rheumatology (ACR) criteria for diagnosing osteoarthritis of knee joint is presence of pain in knee joint and any three of 6 factors listed below.<sup>[9]</sup>

- 1. Age more than 50 years
- 2. Presence of crepitus on active motion
- 3. Less than 30 min of morning stiffness
- 4. Bony tenderness
- 5. Bony overgrowth
- 6. No palpable warmth of synovium.

Data was analysed using Epi info( version 3.5.3), qualitative data was expressed in proportions and, quantitative data in mean± standard deviation. Associations were tested for significance using Chisquare test, and P value <0.05 was taken as significant. Study period was from 2018 to 2019 after obtaining permission from Institutional Human Ethics Committee of Government Medical College Paripally Kollam.

#### **Results:**

In this hospital based study, majority of the study participants were aged above 50 years. Mean age was 56.88 years with a SD of 9.06 years. Women constituted 84.5% of the study population. (Table 1) Most of the study population had education up to middle or high school (45%), with 40% up to higher secondary school and 13.5% degree and above. Very few were illiterate or studied up to primary school. Majority of the study subjects (72%) were home makers or unskilled workers and 16% were semiskilled and 9% professionals.

The proportion of osteoarthritis in any knee among patients aged above 40 years with persistent knee complaints as assessed using ACR Criteria was found to be 72 %( 95% CI 65% to 78%). Among the study population, bilateral osteoarthritis knee was seen in 38.5% (95% CI 31% to 45%). (Table2) Among the study participants, 84% of those affected were women. Among women with OA knee, bilateral OA knee was seen in 87% .Among those with OA knee, it was seen that as compared to unilateral OA knee there was a significant increase of bilateral OA knee with age (Chi square value-10.02 and p value <0.01). (Table 3) The most common symptom was pain, followed by crepitus and bony tenderness. (Table 4)

#### **Discussion**:

Osteoarthritis of the knee is a progressive, degenerative joint disease leading to functional impairment and disability. Even though multiple factors like genetics, obesity, trauma, metabolic imbalances etc are involved in the causation of osteoarthritis, it is seen that prevalence of OA knee increases with age.<sup>[11]</sup> In this study proportion of osteoarthritis in any knee was found to be 72%, with 38.5% having bilateral OA knee. The high proportion of OA might be due to the fact that, only patients aged above 40 years with persistent knee complaints were included in this study. Age is one of the most common risk factor for most non communicable diseases.

Demographic variables		Number	Percentage
	40 - 50	53	26.5 %
Age	51 - 60	70	35 %
(years)	61 - 70	63	31.5 %
	>70	14	7 %
Condon	Male	31	15.5 %
Gender	Female	169	84.5 %
	Hindu	150	75 %
Religion	Christian	12	6 %
	Muslim	38	19 %
Type of family	Joint	15	7.5 %
	Nuclear	176	88 %
	Extended	9	4.5 %

Table 1: Socio-demographic characteristics of study participants (n=200)

Table 2: Proportion of osteoarthritis kneeamong participants (n=200)

Variable	Number (%)		
Bilateral	77	Males	10 (13%)
OA Knee	(38.5%)	Females	67 (87%)
OA of	144	Males	23 (16%)
any knee	(72%)	Females	121 (84%)

Table 3: Age specific distribution of osteoarthritis knee

Age (years)	<b>Unilateral</b> <b>OA</b> <b>knee (%)</b> (n=67)	<b>Bilateral</b> <b>OA</b> <b>knee (%)</b> (n=77)	Total
40 - 50	14(21 %)	3(3.8 %)	17(12%)
51 - 60	23(34 %)	34(44.1%)	57(39%)
> 60	30(45 %)	40(51.9 %)	70(49%)
Total	67(100%)	77(100 %)	144(100%)
(Chi cauara value $10.02$ and p value $< 0.01$ )			

(Chi square value-10.02 and p value < 0.01)

Symptoms	OA right knee (n= 112)		OA left knee (n= 110)	
Symptoms	Number	%	Number	%
Pain	112	100 %	110	100 %
Morning stiffness	26	23.2 %	24	21.8 %
Crepitus	95	84.81 %	101	91.8 %
Bony tenderness	75	67 %	72	65.4 %
Bony overgrowth	13	11.6 %	19	17.3 %
No palpable warmth of synovium	102	91.1 %	98	89.1 %

Table 4: Distribution of signs and symptoms among study subjects with OA Knee\*

\*Multiple responses

With increasing age the risk of degenerative musculoskeletal changes also increases. Older age and history of persistent knee complaints increased the baseline risk of the study population to osteoarthritis. A study conducted in Uttar Pradesh by Sood et al<sup>[10]</sup> showed a prevalence of 78.2% among patients complaining of knee pain. A study among elderly in urban slums of Delhi by Singh AK et al<sup>[6]</sup> showed a prevalence of osteoarthritis knee to be 41.1%, with 37.7% having bilateral OA knee. A study by Sharma MK et al<sup>[11]</sup> showed a prevalence of osteoarthritis among elderly to be 56.6%, and also a higher prevalence of 47.3% among females aged above 40 years.

In this study among those with osteoarthritis knee 84% were women, and among those with bilateral osteoarthritis knee, 87% were women. In a study by Iqbal MN et al<sup>[12]</sup> the prevalence of osteoarthritis was observed to be 74% among women. A study by Salve et al<sup>[13]</sup> found the prevalence of osteoarthritis knee among perimenopausal women to be 47.3%. Studies have shown that women are at increased risk of osteoarthritis as age advances due to lower estrogen at menopause and the role of estrogen in influencing chondrocyte function.<sup>[14,15]</sup>

This study observed an increase in occurrence of osteoarthritis knee with age, with 48.6% among

those affected being above 60 years. The Framingham Osteoarthritis Study by Felson et al<sup>[16]</sup> observed an increase in osteoarthritis associated with age. In this study, among those with bilateral OA knee, 51.9% were aged above 60yrs. Even though aging is strongly associated with development of osteoarthritis, the exact mechanism is still not fully understood. A meta-analysis by Blagojevic et al<sup>[17]</sup>, reported obesity, female gender, history of previous knee injury and age as risk factors of OA knee. The interaction of ageing in conjunction with other risk factors can determine the progression of osteoarthritis in an individual.

Among those with OA knee, the most common symptom was pain, followed by crepitus and bony tenderness. All patients diagnosed with OA knee reported pain at the knee joint. A similar finding was seen in the study by Singh AK et al.<sup>[6]</sup> As osteoarthritis progresses, it leads to thinning and breakdown of cartilage. This results in sclerosis of the subchondral bone, formation of marginal osteophytes and inflammation of synovial membrane. This constant inflammation and stiffness results in pain and discomfort during movement. ACR criteria can be effectively used in early diagnosis OA knee among those with persistent knee complaints.

#### **Conclusion:**

The proportion of OA knee was found to be higher among those with persistent knee complaints and it is seen to increase with age. It was found to be higher among females as compared to males. There is an increase in occurrence of bilateral OA knee with age. The most common symptom was pain, followed by crepitus and bony tenderness. Knee pain associated with osteoarthritis is a key symptom and is often associated with seeking health care.

#### **Recommendations:**

Comprehensive knee examination and assessment using ACR criteria can be used for early diagnosis and thus help in preventing deterioration, and reducing suffering and disability. To improve functional outcomes, it is important to screen those presenting with knee complaints for osteoarthritis. An assessment of burden of osteoarthritis is necessary for the health system for proper planning and policy making and to bring to focus neglected non communicable diseases like osteoarthritis.

#### **Declaration:**

Funding: Nil

#### Conflict of Interest: Nil

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## Health Status of School Going Children: A Cross sectional study in urban area of Jhalawar District, Rajasthan

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#### Abstract:

**Introduction:** The school going age is a formative period, both physically as well as mentally. Poor health status in school aged children is among the causes of poor class performance and high absenteeism. **Objectives:** To assess the health and nutritional status of the school going children in urban area and to determine the association of health problems with age and gender. **Method:** A cross sectional study was carried out in government schools of urban field practice area of tertiary care institute, Jhalawar, Rajasthan. Study was carried out among 2193 students in four government schools. A pretested, semi structured questionnaire was used for collection of data on socio-demographic characters and their health profile. A detailed clinical examination was done from head to toe for every child. Weight and height were measured. Data was entered into the Microsoft Excel 10. Chi square test of significance was used for statistical analysis. **Results:** Most common health problem was dental caries (15.0%) followed by refractive errors (13.1%) and pallor (12.6%). Proportions of pallor and refractive error were significantly increased with increase in age of study participants. 16.8% of the students were found to be having thinness. Moderate stunting was present in 7.3% students. **Conclusion:** Dental caries, refractive errors and pallor were the common morbidities. A significant proportion of school children were undernourished.

Key words: Dental caries, Health status, Morbidities, School children

#### Introduction:

The health of school children and youth is of fundamental importance. Since the beginning of 20<sup>th</sup> century, the importance of school health has been acknowledged across countries. The school health committee (1961) in India recommended medical examination of children at the time of school entry and thereafter every 4 years.<sup>[1]</sup>

Health of the children is the country's biggest human investment. The quality of life of school children, by all standards continues to be poor. It is estimated that every third child has some sign if ill health manifesting in the form of dental, visual and hearing problems, nutritional deficiencies, respiratory infections, skin disorders, loco-motor disabilities etc.<sup>[2]</sup>

In developing countries, the increased burden of communicable diseases among school going children due to poor practices of personal hygiene and insufficient sanitary conditions remains anissue of public health concern.<sup>[3]</sup> Early detection of childhood diseases through school health check-ups at periodic intervals can help in preventing complications.

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Research indicates that poor health status in school aged children is among the causes of low school enrollment, poor class performance, high absenteeism, and early drop-out from schools. These can be easily prevented by promotion of personal hygiene, nutritionand early identificationand treatment of the childhood illnesses.<sup>[4]</sup>

The school going age is a formative period, both physically as well as mentally, transforming the children into promising adults. Pattern of morbidities amongst school aged children vary from one place to another.Poor health status in school age can interfere with learning process and will affect cognitive functions as well as work capacity. With this background, this study was conducted to assess the health status of the school going children in urban schools of Jhalawar district of Rajasthan.

#### Method:

Study Design: The present study was a school based descriptive cross sectional study.

Study area: Study was carried out in government schools of urban field practice area of atertiary care institute in Jhalawar. Jhalawar is a district of Rajasthan, located in southeastern location of state.

Study period: Study was conducted from June 2019 to February 2020.

Study population: Study was carried out among students from class 1<sup>st</sup> to 12<sup>th</sup> standard in government schools. There are total 14 government schools in urban field practice area of tertiary care institute, Jhalawar. Among these, 04 government schools were selected randomly for the present study. Of these selected schools, two schools were of upper primary standard, one was secondary and one school was of senior secondary level. Total 2381 students were registered in these four schools.

Inclusion criteria: All students present on the days of assessments from class  $1^{st}$  to  $12^{th}$  standard

Exclusion criteria: Students absent during all visits to schools for assessment.

Sample size: Out of total 2381 registered students, 188 students were absent during all visits

to schools, hence could not be assessed. So in presence study, total 2193 students were included as study participants.

Method of data collection:

After taking appointments, four to five visits were done to each school on successive days for assessment of students. Assessment was done throughout the school hours. A pretested, predesigned and semi structured questionnaire was used for collection of data on socio-demographic characters ie., age, sex, residenceand their health profile. Age of the students was taken as per school records. A detailed clinical examination was done from head to toe for every child and clinical history was also taken. Visual acuity was tested by using Snellen's charts. Height in centimeters was marked on a wall with the help of a measuring tape. All students were measured against the wall without foot wear and with heels together and their heads positioned so that the line of vision was perpendicular to the body. A glass scale was brought down to the topmost point on the head. The height was recorded to the nearest 1 cm. Weight was recorded after removing belts and shoes using digital weighing machine with accuracy of up-to 100 grams. Body Mass Index (BMI) of all the students was calculated by using the formula: BMI=Weight (in kg)/ (Height in meters)<sup>2</sup>. The height and BMI of the students was then compared with the WHO standards.<sup>[5]</sup>Laboratory investigations were not done due to practical difficulties. Minor ailments of the students were managed at the same time. Students requiring further investigation or management were instructed to consult outpatient departments of tertiary care institute. Health education was provided to students by health talk in prayer assembly using audio visual aids.

Data entry and analysis:

Data was coded and entered into the Microsoft Excel 10. Appropriate tables and figures were generated. Chi square test of significance was used for statistical analysis of the health profile in the school children. p value of less than 0.05 was considered significant. Ethical Approval: Before commencing the study, approval from institutional ethical committee was taken. The purpose of the study was explained in detail and permissions were taken from the principals of the schools. Parents of each participant were informed about the study protocol and informed consent was obtained.

#### **Results:**

In present study, out of total 2193 students, 52.8% students were from standard I to V while 31.0% students belonged to standard VI to VIII. 16.1% students were studying in standard IX to XI. Out of total 2193 study participants, 1257 (57.3%) were males and 936 (42.7%) were females. Majorities of students were from age group 9 to 12 years (42.5%) followed by age group 5 to 8 years (34.7%). Four hundred ninety eight (22.7%) students were in age 13 years and above (Table 1).

Table 1 : Demographic	profile of study	<sup>7</sup> subjects (n= 2193)
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Characteristic	Variable	Number	Percentage
	5-8	762	34.7%
Age Groups	9-12	933	42.5%
(years)	13-16	444	20.2%
	17 and above	54	2.5%
Condon	Male	1257	57.3%
Gender	Female	936	42.7%
	I- V	1158	52.8%
Education	VI-VIII	681	31.0%
	IX-XI	354	16.1%

Most common health problem among school children was dental caries (15.0%) followed by refractive errors (13.1%) and pallor (12.6%). Upper respiratory infections were present in 5.1% students while 4.1% students were suffering from ear discharge. Conjunctivitis was present in 1.2 % students. 2.1 % were suffering from Skin diseases. Other health problems such as Impacted wax in ears, Colour Blindness, Bitots Spots, Angular Stomatitis, Spongy

Table 2: Health	problems of school	children	(n = 2193)
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Health problems*	Number	Percentage
Dental Caries	330	15.0
Ear discharge	90	4.1
Pallor	276	12.6
Refractive errors	288	13.1
Conjunctivitis	27	1.2
Worm infestations	30	1.4
Upper respiratory infections	111	5.1
Skin diseases	45	2.1
Others	108	4.9

#### \* Multiple responses

Bleeding Gums, Asthma, Hypertension, Sports injuries, Menstrual irregularities in girls etc. were found in 4.9% of children. (Table 2)

Table 3 is depicting association between health problems and age of the school children. Proportions of pallor and refractive error were increased with increase in age of study participants and association were statistically significant (p < 0.05). None of the other health problems were significantly associated with age of the school children (p > 0.05).

Association between health problems and gender of school children is illustrated in Table 4. Proportion of pallor was significantly higher (p < 0.05) among female students (15.7%) as compared to male students (10.3%). No significant association found between other health problems and gender of school children (p > 0.05).

Figure 1 represents nutritional status of School Children according to BMI for age Z score charts. BMI for age was normal in 1712 (78.1%) students. Overall 370 (16.8%) of the students were found to be having thinness and severe thinness was present in 63 (2.9%) children. However, 48 (2.2%) students were found to be overweight.

Nutritional status of students according to Height for age Z score charts is illustrated in Figure 2. Height for age was normal in 2016 (91.9%) students.

Health problems	Age Groups (years)			Total	n valua
nearth problems	5-8 (n = 762 )	9-12 (n = 933 )	≥ 13 (n = 498)	(n = 2193)	p value
Dental Caries	144 (18.9)	132 (14.1)	54 (10.8)	330 (15.0)	0.07
Ear discharge	45 (5.9)	36 (3.9)	9 (1.8)	90 (4.1)	0.19
Pallor	63 (8.3)	117 (12.5)	96 (19.3)	276 (12.6)	0.004
Conjunctivitis	12 (1.6)	12 (1.3)	3 (0.6)	27 (1.2)	0.90
Refractive errors	42 (5.5)	147 (15.8)	99 (19.9)	288 (13.1)	<0.001
Worm infestations	18 (2.4)	12 (1.3)	0 (0.0)	30 (1.4)	0.27
Upper respiratory infections	48 (6.3)	36 (3.9)	27 (5.4)	111 (5.1)	0.53
Skin diseases	27 (3.5)	12 (1.3)	6 (1.2)	45 (2.1)	0.23
Others	33 (4.3)	45 (4.8)	30 (6.0)	108 (4.9)	0.85

Figures in parentheses are indicating percentages

Health problems	Gender		Total	n valuo	
ficatui problems	Male (n = 1257)	Female (n = 936)	(n = 2193)	p value	
Dental Caries	174 (13.8)	156 (16.7)	330 (15.0)	0.29	
Ear discharge	57 (4.5)	33 (3.5)	90 (4.1)	0.50	
Pallor	129 (10.3)	147 (15.7)	276 (12.6)	0.03	
Conjunctivitis	18 (1.4)	9 (1.0)	27 (1.2)	0.81	
Refractive errors	174 (13.8)	114 (12.2)	288 (13.1)	0.51	
Worm infestations	18 (1.4)	12 (1.3)	30 (1.4)	0.86	
Upper respiratory infections	72 (5.7)	39 (4.2)	111 (5.1)	0.34	
Skin diseases	24 (1.9)	21 (2.2)	45 (2.1)	0.75	
Others	51 (4.1)	57 (6.1)	108 (4.9)	0.21	

Figures in parentheses are indicating percentages

#### Figure 1: Distribution of School Children according to Nutritional status based on BMI for age



Figure 2: Distribution of School Children according to Nutritional status based on Height for age



Moderate stunting was present in 160 (7.3%) students. Severe stunting was found in 17 (0.8%) students.

#### Discussion:

Present study was carried out to assess the health profile of school going children. School plays a crucial role in establishment of healthy behavior pattern among children as well as in improving the children's physical, social and mental development.

In this study, dental caries was present in 15.0% school children. This finding is in accordance to study by Abu Bashar Md et al<sup>[6]</sup> in which dental caries was present in 18.3% school children. Dental caries was found in 24.2% students in study by Esimai OA et al.<sup>[7]</sup> In contrast to our study, Pradeep Savale et al<sup>[8]</sup> reporteddental caries in 62.36% school going children.

Refractive errors were present in 13.1% school going children in current study which is similar to study by Nehal Patel et al[9](10.2%), Harpal Singh et al<sup>[10]</sup> (13.09%) and Dambhare et al<sup>[11]</sup>(13.8%). In the study by Thekdi et al,<sup>[12]</sup> refractive errors were found in 37% of the school children. In contrast to our study,

refractive errors were present in 2.7% in study by Ananthakrishnan et al<sup>[13]</sup> and 36.62% in study by Deshpande Jayant D et al.<sup>[14]</sup>

In present study, pallor was present in 12.6% school going children. This finding was matched with the result of study by Mohan Shinde et al<sup>[15]</sup> (15.69). In contrast to present study, the prevalence of anaemia in children was 42 % in study by Nilesh Thakor et al<sup>[16]</sup> and 38.23% in study by Syed Abid Asghar et al.<sup>[17]</sup>

In present study, problem of ear discharge was present in 4.1% school children. This finding is similar to study by Nehal Patel et al<sup>[9]</sup>in which ear discharge was observed in 2.8% study participants. However, Syed AbidAsghar et al<sup>[17]</sup> reported ear discharge in 10.0% school children.

Upper respiratory infections were present in 5.1% study participants in present study while 1.2% students were suffering from conjunctivitis. Mohan Shinde et al<sup>[15]</sup>reported Upper respiratory infections in 3.77% while conjunctivitis in 0.44% students. Upper respiratory tract infections were present in 4.67% students in study by Vidya Rani et al.<sup>[18]</sup> In contrast to our study, Upper respiratory infections were reported in 36.99% in study by Nehal Patel et al<sup>[9]</sup> and 17.1% in study by Abu Bashar Md et al.<sup>[6]</sup>

In present study, proportion of pallor was significantly higher among female students (15.7%) as compared to male students (10.3%). In contrast to our study, association between gender of the study participants and anemia was not significant in study by Abu Bashar Md et al<sup>[6]</sup> and Syed AbidAsghar et al.<sup>[17]</sup>

No significant association found between other health problems and gender of school children in our study. However, prevalence of dental caries was significantly higher among female children in study by Syed Abid Asghar et al.<sup>[17]</sup>

In present study, according to BMI for age cut off, 16.8% of the students were found to be having thinness. Severe thinness was present in 2.9% children. In contrast to our study, Srivastav S et  $al^{[19]}$ reported in their study that prevalence of thinness was found to be 23.2% and severe thinness was found to be 7.4%. In study done by Rupali R.

Rajput et al<sup>[20]</sup>, 35.4% had thinness based on BMI, 25.29% had mild to moderate thinness and 10% had severe thinness. Findings of our study are also comparatively less as compared to the study findings of Anand et al<sup>[21]</sup>, in which prevalence was found to be 30.1% in girls and 43.8% in boys and study by Malhotra and Passi<sup>[22]</sup> which also reported the prevalence of thinness among adolescent girls as 30.6%.

In our study, 2.2% students were found to be overweight. This finding is in accordance to study done by Srivastav S et al,<sup>[19]</sup> only 2% were found to be overweight. 3.3% of the participants were found to be obese (BMI >2 SD) in study by Rupali R. Rajput et al<sup>[20]</sup>. Study done in south India on 1800 school children by Kumaravel V et al<sup>[23]</sup>, found prevalence rates of overweight, obesity, and thinness as per international standard were 15.3%, 8.1% and 2.6% respectively.

In present study, Height for age was normal in 91.9% students. Moderate stunting was present in 7.3% students. Severe stunting was found in 0.8% students.In study by Rupali R. Rajput et al,<sup>[20]</sup> the prevalence of stunting was 10.4%, including 0.1% of severely stunted children. The prevalence of stunting was found to be 12% in boys and 13.3% in girls whereas severe stunting was 0.7% in boys and 3.9% in girls study done by Srivastav S et al.<sup>[19]</sup> Anand et al<sup>[21]</sup> found the prevalence of stunting to be 37.2% in boys and 19.9% in girls.

#### **Conclusion:**

Study attempts to highlight the health profile and nutritional status of school going children. Dental caries, refractive errors and pallor were the common morbidities among school going children in present study. A significant proportion of school children were undernourished.

#### **Recommendation:**

Health education should be a regular part of teaching curriculum. Periodic school health checkups involving local health workers and school teachers should be done for early diagnosis and treatment to deal this problem. A comprehensive study with large sample size involving multiple schools including rural and tribal areas will provide better picture of the situation.

#### Limitation of the study:

The present study was carried out among students of urban government schools. The scenario may be different in students of private affluent schools. Health profile may be worsening in students of rural settings.

#### **Relevance of the study:**

An effort is made to assess the health profile and nutritional status of students in urban schools. Early detection of these childhood health problems and under nutrition through periodic school health check-ups can help in improving learning process and cognitive functions as most of the morbidities observed among the school going children can be prevented and the health of the children can be enriched by well-timed intervention.

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#### **Declaration:**

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Conflict of Interest: Nil

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## An Epidemiological Study to Assess Prevalence and Risk factors Associated with Diabetes Among Adolescents in Urban Areas of Udaipur

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#### Abstract:

**Introduction:** Adolescents constitute 20% of world's total population. Adolescents have become quite vulnerable to various non-communicable diseases (NCDs) like hypertension and diabetes mellitus, especially due to the tremendous changes in their lifestyle over the last few decades. The age of onset of Type 2 diabetes in India has been shifting towards ever younger people. Among Indians in their late teens [15-19 years], Type 2 diabetes already manifests itself more often than Type 1 diabetes does. **Objective:** To study prevalence and risk factors for Type 2 diabetes and pre diabetes among male and female adolescents in Udaipur city. **Method:** It was a Community based cross sectional study conducted in three urban areas of Udaipur for 6 months. A total of 1005 adolescents were included in the study. A pretested and predesigned questionnaire was used. **Results:** Prevalence of diabetes was 2.9% in males and 4.4% in females adolescents. Prevalence of smoking, alcoholism, non-vegetarian diet and hypertension was higher among males. **Conclusion:** Diabetes type 2 is a growing problem among adolescents. We need active involvement of health care workers for educating adolescents about risk factors for diabetes.

Keywords: Adolescents, Diabetes, Pre-Diabetes.

#### Introduction:

According to the WHO, adolescence is defined as the period between 10 to 19 years, the second decade of life. This is a period of rapid growth and development for adolescents' bodies, minds and social relationships.<sup>[1]</sup> Adolescence is a process whereby an individual makes the gradual transition from childhood to adulthood and is a critical period of development, second only to the early childhood years. Adolescents constitute 20% of world's total population.<sup>[2]</sup>

According to 2011 Census of India, there are 253.2 million adolescents constituting 20.9% of the

total population.<sup>[3]</sup> This number is ever increasing making it the largest generation to undergo transition from children to adults in the near future, in turn making India the youngest country of the world.

Adolescents have become quite vulnerable to various non-communicable diseases (NCDs) like hypertension and diabetes mellitus, especially due to the tremendous changes in their lifestyle over the last few decades. Over half of NCD related deaths are associated with behaviours that begin or are reinforced during adolescence, including tobacco and alcohol use, poor eating habits, and lack of exercise, compounded by the presence of obesity.<sup>[4]</sup>

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Diabetes Mellitus (DM) is a chronic disorder characterized by raised blood sugar levels that occur when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces.<sup>[5]</sup> The International Diabetes Federation has estimated that about 382 million people all over the world suffer from diabetes. If these trends continue, by 2035, about 592 million people, or every tenth person, will have diabetes.<sup>[6]</sup> In India, the overall diabetes prevalence is 8%. Prevalence is only 0.7% for non-obese, physically active, rural Indians. It reaches 11% for obese, sedentary, urban Indians.<sup>[7]</sup> There are about 1 million juvenile diabetics in India, and every year 12000 diabetic children [2-14 years] die of the disease.<sup>[8]</sup>

Global and national estimates for the prevalence of diabetes in the adolescent age group are unavailable till date. In the United States, May et al found out that the combined prevalence of prediabetes & diabetes in American adolescents was 23% in 2007-2008.<sup>[9]</sup> The largest study in India was conducted by Singh et al among 10,843 adolescents in Chandigarh during the year 2007, and they detected a prevalence of diabetes of 4.2%.<sup>[10]</sup>

Although Type 1 diabetes is the most common form in children, Type 2 diabetes poses a major health problem globally, especially in the developing world. The age of onset of Type 2 diabetes in India has been shifting towards ever younger people. Among Indians in their late teens [15-19 years], Type 2 diabetes already manifests itself more often than Type 1 diabetes does.<sup>[11]</sup> Type 2 diabetes in children and adolescents is probably under-diagnosed because it can exist without symptoms. The clinical manifestations of T2DM are preceded by an asymptomatic prodromal period called 'prediabetes'.

Against the above background, the present study was carried out with the objective to study the prevalence of diabetes and associated risk factors among individuals in the age group 10-19 years in urban areas of Udaipur, Rajasthan.

#### Method:

**Study Design :** Community based cross sectional study.

**Study Area :** The study was conducted in three urban areas of Udaipur – Bhuwana [population 17660], Fatehpura [2 lakhs population] and Siphon [10000 population]. The three areas were selected as they are catered by the Department of Community Medicine of the medical college.

**Study Period :** Study was conducted for a period of 6 months from July 2019 to December 2019.

**Study Subjects :** Males and females of 10-19 years residing in these areas

**Sample Size :** At 95% confidence level and taking the prevalence of diabetes and prediabetes to be 9.5% with a relative error of 20%, the sample size came out to be 934 using the formula

#### $\mathbf{n} = \mathbf{Z}_{\alpha}^{2} \mathbf{p} \mathbf{q} / \mathbf{L}^{2},$

Where n = sample size

 $Z\alpha$  = 1.96 value of the standard normal variate corresponding to level of significance alpha 5 %

- $p = prevalence of diabetes^{[12]}, 9.5\%$
- q = 100 p, 90.5%
- L = precision, 20%

Accounting for a non-response rate of 20%, a total of 1027 subjects were to be included. Out of these, 22 did not give consent to be part of the study, hence 1005 adolescents were included in the study. By simple random sampling, subjects were selected from the three areas. Proportionate probability sampling was followed.

#### Inclusion Criteria:

- 1. All males and females of 10-19 years after getting consent from them and informed written consent from their parents if they are <18 years, or after getting consent from them if they are 18 years or older.
- 2. The person should be a resident of the area mentioned above for a minimum of 6 months.

**Study Instruments :** A predesigned, pretested, semistructured questionnaire containing items on (a) identification data i.e. age, gender, religion, educational status, area of residence, socioeconomic status of the person, (b) risk factor for diabetes i.e. obesity, sedentary lifestyle, smoking, alcohol, family history, dietary habits, history of consanguinity, etc. The questionnaire was pilot tested among 20 adolescents in the village of Delwara in June 2019, and questions were later modified to ensure that the subjects would have no difficulty in understanding and answering them. Glucometer, digital sphygmomanometer, measuring tape and weighing scale were used in the study. Following criteria were used.

<u>Hypertension</u>: The hypertension status of the study participants was assessed by using standard criteria formulated by the American Health Association (AHA) -2017.<sup>[13]</sup>

<u>Diabetes criteria</u>: Blood sugar determination (fasting) was done by glucometer by glucose oxidase

Characteristics	Total [n=1005]		
	Males [n=527] n (%)	Females [n=478] n (%)	
Age (years)			
10-14	271 (51.4)	236 (49.4)	
15-19	256 (48.6)	242 (50.6)	
Religion	•		
Hindu	179 (33.9)	154 (32.2)	
Muslim	326 (61.9)	306 (64)	
Sikh	17 (3.2)	10 (2.1)	
Christian	5 (1)	8 (1.7)	
Education			
Illiterate	0	0	
Primary/ Just literate	27 (5.1)	43 (8.9)	
Middle School	198 (37.6)	182 (38.2)	
High School	227 (43.1)	219 (45.8)	
Intermediate/Diploma	75 (14.2)	34 (7.1)	
Occupation	4	1	
Student	403 (76.5)	353 (73.9)	
School dropout	22 (4.2)	80 (16.7)	
Unskilled worker*	78 (14.8)	27 (5.7)	
Semi-skilled worker**	24 (4.6)	18 (3.8)	
Marital Status			
Married	12 (2.3)	56 (11.7)	
Unmarried	515 (97.7)	422 (88.3)	

#### Table 1: Socio-demographic profile of study subjects

\*Unskilled worker: Person who are doing work which requires neither education nor specialized training. \*\*Semi-skilled worker: person who are doing work which requires some training to know their routine jobs efficiently. method as per WHO and were interpreted. In the case of fasting plasma glucose (FPG) > 126mg /dl, a second determination was performed.<sup>[14]</sup>

<u>Obesity criteria:</u> Body mass index of the person was calculated using height and weight by applying the formula weight (in kgs) divided by square of height (in m<sup>2</sup>).The cutoff criteria are based on the WHO BMI-for-age growth charts. Adolescents with BMI values at or above the 95<sup>th</sup> percentile of the sex-specific BMI growth charts are classified as obese.<sup>[15]</sup>

Ethical clearance and analysis: Institutional ethical clearance was taken. [No. AIMS/IEC/2019/022]. Statistical analysis was done using SPSS version 21.0.

#### **Results:**

Table 1 shows Majority of the subjects, 403 (76.5%) males and 353 (73.9%) females, were students. It was found that 22 (4.2%) males and 80 (16.7%) females were school dropouts and

not doing anything. Out of 527 males, 24 (4.55%) and 78 (14.8%) were semi-skilled and unskilled workers respectively. It was also observed that, 12 (2.3%) males and 56 (11.7%) females were married, thereby highlighting the high prevalence of teenage marriage among adolescent girls. [Table 1]

Table 2 highlights that the prevalence of diabetes was 2.9% in males and 4.4% in females but the difference was not statistically significant ( $\chi^2$ =3.66, p value 0.16)

Table 3 shows prevalence of smoking, alcoholism, non-vegetarian diet and hypertension was higher among males as compared to females. However, the difference was significant only for smoking ( $\chi$ 2=13.93, p value<0.001), alcoholism ( $\chi$ 2=36.76, p value<0.001) and non-vegetarian diet ( $\chi$ 2=4.51, p value 0.03).

Classification of Diabetes	Males [n= 527] n (%)	Females [n=478] n (%)	Total [n=1005] n (%)	χ² value, d.f, p value
Normal	485 (92)	423 (88.5)	908 (90.4)	
Prediabetes	27 (5.1)	34(7.1)	61(6.1)	0.16 J.66, 2,
Diabetes	15 (2.9)	21 (4.4)	36 (3.6)	

Table 2 : Prevalence of diabetes among the study subjects

Table 3 : Prevalence of risk factors of diabetes according to sex among the study subjects

Risk Factors	Males (N=527) n (%)	Females (N=478) n (%)	Total [n=1005] n (%)	χ² value, p value
Family history of diabetes	66 (12.5)	78 (16.3)	134 (13.3)	2.94,0.08
Obesity	33 (6.3)	69(14.4)	102 (10.2)	18.36,0.001**
Sedentary lifestyle#	78 (14.8)	107 (22.4)	185 (18.4)	9.6,0.002*
Smoking	41 (7.8)	12 (2.5)	53 (5.3)	13.93,0.001**
Alcoholism	57 (10.8)	7 (1.5)	64 (6.4)	36.76,0.001**
Non-vegetarian diet	381 (72.3)	316 (66.1)	697 (69.4)	4.51,0.03*
Hypertension	38 (7.2)	27 (5.7)	65 (6.5)	1.01,0.32

\*p value <0.05 \*\* p value <0.001 # Sedentary: type of lifestyle with little or no physical activity.

<b>Risk factors</b>	Odds ratio(95% CI)	p value			
Age group					
10-14 years	Reference	-			
15-19 years	2.03(1.25-4.03)	0.02			
S	ocio economic class				
Upper/Upper middle	Reference	-			
Lower middle	1.09(0.61-1.95)	0.76			
Upper lower/Lower	1.64(0.85-3.19)	0.13			
	BMI				
Non obese	Reference	-			
Obese	1.86(1.05-3.37)	0.05			
Fam	ily history of diabetes				
No	Reference	-			
Yes	2.16(1.27-3.66)	0.01			
	Physical activity				
Moderate activity Reference					
Sedentary lifestyle	1.90(0.98-3.69)	0.05			
	Currently smoking				
No	Reference	-			
Yes	0.87(0.31-1.67)	0.46			
Diet					
Vegetarian	Reference	-			
Non-vegetarian	1.93(0.98-2.86)	0.06			
Hypertension					
Absent	Reference	-			
Present	1.79(1.11-2.45)	0.050			

#### Table 4 : Multivariate Logistic regression analysis of different risk factors for diabetes

Table 4 highlights that subjects of 15-19 years age group experienced 2.03 times greater risk of getting diabetes as compared to subjects in the age group of 10-14 years (p value 0.02). Subjects who were obese experienced 1.86 times greater risk in comparison to those who were not obese (p value 0.05). Subjects with a positive family history of diabetes experienced 2.16 times greater risk of getting diabetes (p value 0.01). Subjects who led a sedentary lifestyle experienced 1.90 times greater risk of getting diabetes as compared to those engaged in moderate

activity (p value 0.05). Subjects who were hypertensive experienced 1.79 times greater risk as compared to those who were not hypertensive (0.05).

#### **Discussion**:

The prevalence of diabetes in the present study was observed to be 3.6% among study subjects (2.9% in males and 4.4% in females) while the prevalence of prediabetes was observed to be 6.1% among the study subjects (5.1% in males and 7.1%)

in females). Hence, the combined prevalence of diabetes and prediabetes among the study subjects was observed to be 9.7%. This was observed to be higher than that in the previous studies conducted by Ramachandran et al<sup>[16]</sup> among adolescents [12-19 years] in Chennai in 2007 (combined prediabetes and diabetes prevalence of 5.8%), by Singh et al<sup>[10]</sup> among 10,843 schoolgoing adolescents in Chandigarh in 2007 (4.2% prevalence of diabetes and 1.6% prevalence of prediabetes), by Balagopal<sup>[17]</sup> among adolescent youth [10-17 years] in rural areas of Tamil Nadu in 2008 (combined prevalence of 5.1%), and by Reddy<sup>[18]</sup> among corporate schoolchildren [7-14 years] in Nellore, Andhra Pradesh in 2011 (combined prediabetes and diabetes prevalence of 9.5%) The present study showed an increasing prevalence of diabetes with increasing age with 2.2% prevalence of diabetes in the age group of 10-14 years, and 5% prevalence of diabetes in the age group of 15-19 years (p value=0.015). The increasing prevalence of diabetes in the present study could be attributed to urbanization, sedentary lifestyle, physical inactivity and presence of addictions like tobacco use and alcohol consumption.

The present study showed a significantly higher prevalence in subjects with a positive family history of diabetes (11.2%) as compared to those without positive family history of diabetes (2.4%,  $\chi^2$ = 25.94, p value<0.001). In a multisite case-control study done in North India by Vikram et al<sup>[19]</sup> in 2006, it was found that a significantly higher number of cases had a history of type 2 diabetes in first-degree relatives as compared with controls [82.3% vs 23.2%, p value<0.001]. Anjana RM et al<sup>[20]</sup>, in a communitybased study on adolescents [12-19 years] in Chennai, detected that blood sugar levels were significantly higher in the group with two diabetic patients as compared to the groups with one diabetic parent, and no diabetic parents.

The present study showed an increasing prevalence of diabetes with increasing age with 2.2% prevalence of diabetes in the age group of 10-14

years, and 5% prevalence of diabetes in the age group of 15-19 years (p value=0.015).

The present study showed an increasing prevalence of diabetes with increasing body mass index (BMI), with 2.4% prevalence of diabetes in non-obese persons compared to 13.7% prevalence of diabetes in obese persons ( $\chi^2$  = 30.63, p value<0.001). In a multisite case-control study conducted by Vikram et al<sup>[19]</sup> among adolescents and young adults in North India in 2006, it was observed that obesity was a risk factor for diabetes [OR=7.9(2.5-25.44)].

The present study showed that the prevalence of diabetes was significantly higher in adolescents who led a sedentary lifestyle (4.6%) as compared to those doing moderate work (1.9%,  $\chi$ 2= 5.25, p value 0.02). (Table 4) These findings are consistent with other studies done either in India or abroad. A multicentric study conducted by Mohan et al<sup>[21]</sup> in various parts of India from April 2003-March 2005 as part of the WHO-ICMR Indian NCD risk factor surveillance has found physical inactivity to be a strong risk factor for type 2 diabetes.

#### **Conclusion and Recommendations:**

Overall prevalence of diabetes was found to be 3.6%. Intensive IEC campaigns through multipronged strategies is needed to educate adolescents about diabetes, both in schools from primary level onwards as well as in communities, particularly focusing on – (1) prevention by recognition of important risk factors and lifestyle modifications (2) early diagnosis and treatment by recognition of symptoms.

Healthy lifestyle changes like change in food habits in terms of reduction of salty and fatty food, promotion of balanced diet complemented by regular exercise, weight reduction, etc. should be promoted through all strategies to reduce the prevalence of both diabetes.

#### **Declaration:**

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### The Social Capital among Elderly Population of Chandigarh: Cross Sectional Study

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#### Abstract:

**Introduction**: Social capital is defined as social cohesion among communities. This refers to processes between people which establish network, social trust and co-operation and mutual benefit. The present study was conducted to know the status of social capital among elderly population of Chandigarh city, India. **Method** : The study was conducted from January to April 2017. The study was community based using convenience sampling. A total of 300 elderly subjects were selected for interview from the electoral rolls. The survey instrument was modified Onyx and Bullen scale consisting of 30 items with responses on likert scale from 1-4. **Results**: Mean age of respondents was 66.47 years. Male: Female ratio was 1.4:1. 45.7% owned their residence whereas 54.3% lived as tenants. Social capital score of majorities of elderly was good (63.7%) followed by average (19.3%).Highest mean scores were received for questions namely: would you help someone if their vehicle breaks down (3.03±0.69), do you agree to helping yourself when you help others (3.15±0.78) and have you visited your neighborhood in the past week (3.01±0.82). Poorest scorewere received for questions: while on shopping, are likely to run into friends (1.11±0.53) and have you done a favor for a sick neighbor in last 6 months (1.33±0.53). **Conclusion**: Social capital status among elderly of Chandigarh city was good and higher scores were seen among males. Highest mean scores were seen in factor 4 (proactivity in social context) and lowest among family and factor 5 (friend's connections).

Key words : Community, Elderly, Self Report, Onyx Bullen Scale, Social Capital, Social Participation

#### Introduction:

According to World Health Organization, Social capital represents the degree of social cohesion which exists in communities.<sup>[1]</sup>It refers to the processes between people which establish networks, norms, social trust and facilitate co-ordinationandco-operation for mutual benefit. An advanced level of social participation might support physical and

mental activity and feelings of security and active engagement might result from more neighborhood and family connections.<sup>[2,3]</sup> This sense is particularly important in older people and it is now being recognized as a critical problem, along with the increase in life expectancy and the growing number of older people.<sup>[4,5]</sup>With the changing nature of society in recent years, many older people,

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compared to other age groups, are at risk of social isolation and of having limited contact with others.<sup>[6]</sup>A range of circumstances can place older people at an increased risk of social exclusion.<sup>[7]</sup>They might lose important parts of their social environments duringretirement or lose a partner, relatives and friends through illness, death or change in geographic location, and their health might deteriorate (disease and disability).<sup>[6,7]</sup>The transformations that occur in the physical and cognitive abilities of older adults can cause them to come to depend more seriously on social capital at each of these levels.<sup>[2]</sup> A greater level of trust could provide older adults with greater emotional. economic and logistical resources.<sup>[8]</sup>Different social and healthcare programs planned for older individuals might originate from varying levels of social capital between different origins, which requires more consideration.<sup>[9]</sup>

Social capital is a new area of research among older Indian adults. There have been some studies in this field; however, none of them have studied elderly adults as a population.<sup>[10,11]</sup>Much research into social capital has been conducted in the U.S. and other western countries, which ignores the cultural context of its conceptualization. Caution must be applied in comparisons in which the cultural context of social capital is ignored.<sup>[12]</sup>The modern day understanding of social capital encompasses a range of concepts including community networks, civic engagement, reciprocity and social cohesion. Against this background, the present study was planned to know about status of social capital among elderly population of Chandigarh.

#### Method:

**Study area :** Chandigarh is the Union Territory (UT) of India and capital of two states, Punjab and Haryana, with population of 10.54 lakhs (Census 2011). Majority i.e. 1,025,682 (97.25%) of its population is urban including slums and 29,004 (2.75%) is rural population with 6.4% of Chandigarh's total population as elderly (60 years and more).<sup>[13]</sup>

**Study participants:** Subjects with age 60 years and above.

**Study period:** Study was conducted from 1<sup>st</sup>January 2017 to 30<sup>th</sup>April 2017

**Study design:** A community based cross-sectional study done using convenience sampling technique. This study was conducted in Sector 41 and adjoining villages Baterla and Adhere.

**Sample size :** A total number of 300 participants were selected for the interview from the Electoral roll (2017).<sup>[14]</sup>

Taking a prevalence of good social capital score from a pilot study conducted (75%), 95% confidence interval and precision of 5%, sample size was calculated as 288. Thus, a total sample of 300 was considered for the present study.

Study tool: The social capital questionnaire was initially developed by developed by Onyx and Bullen (2000) and consisted of 32 questions answered using a 4-point Likert-type response scale as follows: 1. No, not at all; 2. No, not much; 3. Yes, frequently; and 4. Yes, definitely.<sup>[15]</sup>The social capital scale included the following eight dimensions: Participation in Community; Feelings of Trust Neighborhood and Safety; Connections; Tolerance of Diversity; Value of Life; Family Connections; Pro-activity in Social Contexts; and Work Connections. The Onyx and Bullen scale of social capital was primarily developed in Australia. It is being modified according to Indian context and only 30 questions were structures covering the eight domains. A pilot study was initially conducted among 10 randomly selected participants who were residing in area other than the study areaand response from these elders they were not included in the final study. The feedback from the pilot study was integrated in the final version of the questionnaire.

**Data Collection:** Electoral roll was used to identify families/households with elderly subjects and they were approached to participate in the study. In case of refusal, next available household was approached.

Sample selection was continued till the sample size was exhausted. Eligible participants were approached by the investigator by making house to house visit and data was collected after obtaining written informed consent for the participation in the study consent. They were distributed a self administered 30 Questions Questionnaire keeping in mind their availability, free time and convenience & feasibility. Subjects were approached at the time of their choice after taking consent. In case of nonavailability after 3 attempts, next household was selected for enrolment. Time taken to fill the questionnaire was 15-20 minutes and an average of 18 minutes per participants.

#### Social Capital Score<sup>[15]</sup>

The social capital score of an individual is calculated by administering the questionnaire, and when summed together forsampledpopulation, social capital score for community is calculated. There are eight factors associated with Social Capital. The set of questions among these factors are so distributed that they forma consistencyin the questionsand the respondent may not feel stressed whileanswering.

- Factor 1 (Feeling of Trust and Safety) :Q5+Q6+ Q7+Q9+Q14
- Factor 2 (Tolerance of diversity):Q25
- Factor 3 (Value for Life):Q1+Q2
- Factor 4 (Social agencies): Q3+Q17+Q19+Q23 +Q24+Q29+Q30

- Factor 5 (Family and friend's connections): Q16
- Factor 6(Neighborhood connections):Q8+Q10 +Q11+Q15+Q18+Q20
- Factor 7 (Community connections):Q4+Q12+ Q13+Q21+Q22
- Factor 8 (Work connections): Q26+Q27+Q28

**Calculation of General social capital score:** General social capital score is calculated by summation of the scores of eight factors with 30 questions (F1+F2+F3+F4+F5+F6+F7+F8). The higher the score, the higher the level of social capital. The score of the General Social capital represents the social capital of the individual- Poor:  $d \leq 30$ ; Average 31-60; Good 61-80; Very Good 81-100; Excellent 101-120. The tool used in present study has been validated in Indian settings. Socio economic status was assessed using the Modified Kuppuswamy scale (2016).<sup>[16]</sup>

**Statistical analysis:** Data was entered in Microsoft excelspreadsheetandanalyzedusing OpenEpi 2007. Descriptive analysis was used to summarize data using frequency, percentages and mean (±standard deviation).

**Ethical considerations:** After taking permission from ethical committee, written consent was taken from the respondents prior to initiation of the study. Confidentiality and anonymity of the respondent was strictly maintained. Respondents were given the option of quitting from the study if desired by them with noelement of compulsion.

Social Capital status	Overall	Male	Female
Average	58 (19.3%)	26 (15%)	32 (32%)
Good	191 (63.7%)	115 (65.7%)	76 (60.8%)
Very good	49 (16.3%)	32 (18.3%)	17 (13.6%)
Excellent	2 (0.7%)	2 (1.1%)	0 (0)
Total	300	175	125

Table 1 : Distribution of respondents according to overall Social capital Status (n=300)

#### **Results:**

The current study found that maximum numbers of respondents were in the age group of 60-69 years (73.3%) and minimum in age group of 80 years and above (4.4%). Mean ( $\pm$ SD) age of the respondent was 66.47 ( $\pm$ 5.8) years. Male-female ratio was 1.4:1 (175/125). Mean (SD) age was 66.1 ( $\pm$ 5.7) years for male and 66.8 ( $\pm$ 5.8) years for female respondents.Out of total respondents, 45.7% owned their residence whereas overall maximum number of respondents was living as tenants (54.3%). Table 1 shows the distribution of social capital category.

According to type of family, one fourth (23.4%) of the respondents living in joint family had average social capital status, where as those who lived in nuclear family 18.4% of them had average social capital status. Table 2 shows the distribution of responses received from the participants in Likert scale.

	Question	No, not at all (1)	No, not much (2)	Yes, frequently (3	Yes, definitely (4)	Mean±SD
Q.1	Do you feel safe walking down your street at dark?	1 (0.3)	62 (20.9)	176 (59.5)	57 (19.3)	2.98±0.64
Q.2	Do you agree that most people can be refused?	5 (1.7)	73 (24.7)	158 (53.4)	60 (20.3)	2.92±0.71
Q.3	If someone's vehicle breaks down outside your house, do you invite them in and let them use your phone?	-	67 (22.6)	154 (52.1)	75 (25.3)	3.03±0.69
Q.4	Does your area have a reputation of being safe?	49 (16.6)	112 (37.8)	99 (33.4)	36 (12.2)	2.41±0.90
Q.5	Does your locality feel like home?	9 (3)	62 (20.9)	160 (54.1)	65 (22)	2.95±0.74
Q.6	Do you enjoy living with people with different life styles?	15 (5.1)	104 (35.1)	138 (46.6)	39 (13.2)	2.68±0.76
Q.7	Do you feel valued in the society?	8 (2.7)	79 (26.7)	145 (49)	64 (21.6)	2.90±0.76
Q.8	If you were to die tomorrow, would you be satisfied with what you have achieved in your life?	23 (7.8)	99 (33.4)	134 (45.3)	40 (13.5)	2.65±0.81
Q.9	"You help yourself by helping other" Do you agree?	8 (2.7)	48 (16.2)	133 (44.9)	107 (36.7)	3.15±0.78
Q.10	Do you go outside your locality to visit your family?	41 (13.9)	109 (36.8)	106 (35.8)	40 (13.5)	2.49±0.89
Q.11	When you need information regarding government programmes or policies, do you know where to find the information?	24 (8.1)	114 (38.5)	110 (37.2)	48 (16.2)	2.61±0.85
Q.12	If you disagree with what everyone has agreed upon would you feel free to speak?	41 (13.9)	73 (24.7)	123 (41.6)	59 (19.9)	2.68±0.94

#### Table 2 : Revised Onyx and Bullen scale [Frequency, percentage and mean scores]

Q.13	If you have dispute with your neighbour, would you complaint to authorities?	101 (34.1)	78 (26.4)	77 (26)	40 (13.5)	2.19+1.05
0.14	At work do you take the initiative to		, 0 (2011)			
Q.14	do what needs to be done even if no one asks you to?	17 (5.7)	76 (25.7)	138 (46.6)	65 (22)	2.85±0.82
Q.15	In the past week, have you helped your workmate even if it's not the	10 (2 4)	97 (20 4)	106 (25.9)	02 (21 4)	2 05+0 96
0.1.6		10 (3.4)	07 (29.4)	100 (33.0)	95 (51.4)	2.95±0.00
Q.16	/dinner, with friends outside your household?	62 (20.9)	96 (32.4)	88 (29.7)	50 (16.9)	2.43±1.00
Q.17	Can you get help from friends when you need it?	30 (10.1)	98 (33.1)	104 (35.1)	64 (21.6)	2.68±0.92
Q.18	If you were caring for a child, and need to go out for a while, would you ask for help from your neighbours?	12 (4.1)	75 (25.3)	143 (48.3)	66 (22.3)	2.89±0.79
Q.19	Have you visited your neighbourhood on the past week?	12 (4.1)	62 (20.9)	133 (44.9)	89 (30.1)	3.01±0.82
Q.20	How many people did you talk to yesterday?	168 (56.8)	108 (36.5)	14 (4.7)	6 (2)	1.52±0.68
Q.21	When you go shopping in local area, you likely to run into friends and acquaintances?	280 (94.6)	7 (2.4)	-	9 (3)	1.11±0.53
Q.22	In past 6 months, have you done any favor for a sick neighbour?	206 (69.6)	83 (28)	6 (2)	1 (0.3)	1.33±0.53
Q.23	Do you help out in local group as a volunteer?	20 (6.8)	87 (29.4)	145 (49)	44 (14.9)	2.72±0.79
Q.24	Have you attended a local community event in past 6 months?	69 (23.3)	96 (32.4)	103 (34.8)	28 (9.5)	2.30±0.93
Q.25	Are you an active member of local organization/group?	29 (9.8)	82 (27.7)	143 (48.3)	42 (14.2)	2.67±0.83
Q.26	Are you on management or organizing committee of any local group or organization?	205 (69.3)	16 (5.4)	57 (19.3)	18 (6.1)	1.62±0.99
Q.27	In the past 1 year, have you joined in any local community action to deal with an emergency (fire, flood,	202 (69 2)	24 (9 1)	40 (16 6)	21 (7 1)	1 62+0 00
		202 (08.2)	24 (0.1)	47 [10.0]	21(/.1)	1.0310.99
Q.28	geographic community where you work?	202 (68.2)	17 (5.7)	50 (16.9)	27 (9.1)	1.67±1.05
Q.29	Are your work inmates also your friends?	204 (68.9)	21 (7.1)	43 (14.5)	28 (9.5)	1.65±1.04
Q.30	Do you feel a part of the team at your work?	209 (70.6)	16 (5.4)	45 (15.2)	26 (8.8)	1.62±1.03
-						

It was observed that 106 (35.6%) respondents agreed that their living area is safe, where as 160 (53.6%) of the respondents were most likely to feel safe while walking down the street at dark. It was seen that 30 (10.3%) of the respondents had not much tolerance to diversity. In question in related to value of life, 58 (19.4%) and 62 (20.8%) of the respondents felt valued in the society as well as they were satisfied with their achievements in life respectively. Only 23 (9.3%) and 7 (2.3%) of the subjects said that they would take decision for needful even if no one asks them to do and not helping their workmate when it was not part of their jobs description. 50(16.7%) the re-spondents had lunch/dinner with friends outside their household over the weekend. 124(41.6%) respondents had attended more than onetime local community event in past 6 months (Kirtan, Birthday etc). Overall, only10.1% of the elder respondents participated in the community as volunteers or as a parts of a local association and feelings of trust and safety, pro-activity in a social context and neighborhood connections were relatively high (23.8%, 22.7%, 20.3% respectively).

#### Discussion:

In the present study, males (58.3%) respondents were more than females (41.7%) and these findings are in accordance with elderly population in Chandigarh as percensus2011. Shim<sup>[17]</sup> had similar findings i.e. majority of the respondents in the study were males (60.3%). In the present study mean (SD) age of the respondents was 66.4(SD-5.7) years which is lower than the mean age of study subjects in China, 70.9 years.<sup>[18]</sup>This difference could be because China has high life expectancy rate at birth (76.1 years) than India (69.0 years).<sup>[14]</sup>

In present study, two-third (68.7 %) of the respondents lived in a nuclear family and rest of the respondents lived in joint family whereas in Iranian study, 57.8% and 34.8% lives with spouse & children and with spouse alone.<sup>[17]</sup> This may be due to fact that joint family concept is adopted in India.<sup>[19]</sup>As suggested by our findings that those respondents living in nuclear family had higher

mean score for social capital status. It was also found that more number of respondents in nuclear family scored higher in Factor 5 i.e., friends and family connections in the present study.

Overall in our study majority of male respondents has better social capital status (65.7%) than female (60.8%) counter parts. Excellent social capital score found in only two subjects which were males. It was also found that only 10.1% of the respondents participated in the community as volunteers or as a part of a local association, whereas, feelings of trust and safety, pro-activity in a social context and neighborhood connections were relatively higher(23.8%, 22.7%, 20.3% respectively). However, Iranian study found that respondents had very high pro activity in social context (70.9%) followed by feeling of trust(67.8%).<sup>[17]</sup>In the present study the highest degree of response of social capital reported by the participants was for feeling of trust and safety (23.8%) followed by Proactivity in social context (22.7%). These findings differed from the findings by Ponce who concluded that family social capital is a major determinant of social participation of older adults, which was not found to be true in the present study.<sup>[20]</sup>

Regarding bridging social capital, present study found that neighborhood connections were found to be having higher scores than tolerance of diversity. Daoud<sup>[21]</sup>concluded that lower social cohesion (bonding) was associated with higher depression in Neighborhood Effect on Health and Well-being (NEHW)which is similar to findings in a study by Julie et al.<sup>[22]</sup> which found that that bonding social capital was significantly associated with physical and emotional health. Gray et al. reported a reduction in participation of those of advanced age in social clubs, except for religious organizations.<sup>[23]</sup>

Low levels of participation of elder adults in community as volunteers (10.1%) as found by Tsai et al. concluding that mobility is important for community independence.<sup>[24]</sup> With increasing age, underlying pathologies, genetic vulnerabilities, physiological & sensory impairments and
environmental barriers, the capacity of mobility also declined. Understanding how mobility declines is paramount to finding ways to promote mobility in old age.<sup>[24]</sup>Better social capital (using measures of neighborhood trust and community participation) is associated with a higher degree of physical mobility, independence and mental well-being among older individuals.<sup>[25]</sup> In Sweden, the researchers found that most of the older participants, despite the ageing process, attempted to remain active and connected to the community.<sup>[26]</sup> It was also found that social participation increased with advancing age and then declined after the age of 80.<sup>[20]</sup>

Overall both male and female felt equal level of trust and safety in present study with similar findings in Iranian older adults.<sup>[17]</sup>People have greater trust in those with whom they have broader and regular communication especially specially in the rural areas. Also, hope of continuous relationships in the future can facilitate the development of trust.<sup>[27, 28]</sup>Alesina and La Ferrara reported that three main issues could contribute to promoting trust: personal traits, being a member of groups and features of the community.<sup>[29]</sup>Barr and Russell et al., reported that 64 percent of older women did not feel safe walking down their streets after dark<sup>[30]</sup>; however, more than two thirds (66.7 percent) of our respondents reported a feeling of safety. Onyx and Bullen also reported that women had poorer feelings of safety in their local communities.<sup>[15]</sup>

Aihara and colleagues reported greater cognitive social capital among men in a study. They concluded that contributions to local organizations and having healthy behaviors were linked to cognitive social capital which is significant for successful ageing.<sup>[29]</sup> Heenan et al., in a study at Northern Ireland, reported that there was evidence of strong mutual relationships between older people and their neighbors.<sup>[31]</sup>The present study had participants from urban are as who reported high feelings of trust and safety and neighbourhood connections, rather than participation in the community, which supported Onyx and Bullen's findings that urban area had high neighborhood connection and felt more safe and found people trust worthy. Hodgkin in his study reported that age was a significant determinant of people'sactivities. Older people, predominantly those who were retired, engaged in more community participation and social activities, such as volunteer groups, social clubs and church groups.<sup>[32]</sup>

The study had some limitation which wereshort duration of the study and under (or over) reporting of the databy respondents.Convenient sampling technique was used to select the participants due to time constraints.

#### **Conclusion:**

The findings in our study shows that social capital status of elderly sampled population (mean score-68.7) is in the range of good score (61-80). Age group of 60-69 years (63.2%) scored thehighest on the social capital scale. Males scored higher than females in overall social capital score. Out of the eight factors associated with social capital, highest Mean (SD) was for i.e. factor 4: Proactivity in social context (15.6±3.7). And lowest was for factor 5, i.e. family and friends connections. More studies should be conducted to get comprehensive results for cognitive and structural aspects of social capital.

#### **Declaration:**

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# Social Media Use and its Association with Sexual Practices among Undergraduate students in a Private Medical University at Solan, Himachal Pradesh Arjit Kumar<sup>1</sup>

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#### Abstract:

**Introduction:** Social networking has become integral to the intellectual and social lives of the young populace. Their often unrestricted access to sexually explicit content and associated adverse sexual health constitute key outcomes in public health research. **Objectives:** To determine the association between social media use and various sexual practices among undergraduate students in a private medical university at Solan, Himachal Pradesh. Method: We enrolled 300 undergraduates, using random sampling technique in the present cross sectional study. Data were collected using semi-structured questionnaire and data analysis employed statistical package for social sciences version 22.0. Chi-square test was used to determine association between variables and p value<0.05 was considered as statistically significant. **Results:** The mean age of respondents was 21.85+2.63 years. Majority of the respondents have heard about social media (n=299, 99.7%) and majority have received information from friends/peers (79%). The commonest reason for non-use of social media for sexually explicit content was lack of interest (54.3%). The mean age at sexual debut was 17.44 + 2.63 years. There was statistically significant association between use of social media for sexually explicit content and being sexually active (p=0.000), type of sexual acts practiced (p=0.003) and number of sexual partners (p=0.000). **Conclusion:** There is need for improved multi- sectoral measures (formal comprehensive sex education, peer education programs, school mini-media clubs and targeted behavior change intervention), Media and internet literacy education to control viewing of social media for sexually explicit content, while ensuring that young people's access to sexual health educational content is not compromised.

Key words: Sexual Practices, Social Media, Undergraduate

#### Introduction:

Several theories of media effects have documented the central place of content on influence of the media. One key source of risks from the manner in which humans experience and express their sexuality, is exposure to social media with sexually explicit content.<sup>[1]</sup> Emerging evidence also suggests that social media affects sexual practices among young people.<sup>[2-5]</sup>

"Social media (or social networking) are interactive computer-mediated technologies that facilitate the creation and sharing of information,

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ideas, careers, interest and other forms of expression via virtual communities and networks."<sup>[6]</sup> Since the advent of social networking sites, classmate.com, in 1995 and six degrees; in 1997, a plethora of social interaction outlets has flooded the internet space.<sup>[6-8]</sup> These include: Facebook, WhatsApp, Twitter, etc. <sup>[9]</sup>

A paradigm shift in the delivery of digital interventions was the launch of internet access via smartphones and the development of apps for these phones.<sup>[10]</sup> Researchers have reported increasingly easy access to sexually explicit content on the social media, coupled with dwindling sexuality education at homes or schools.<sup>[11]</sup> They noted that social media can serve as useful tool in behaviour-change initiative received by digital routes. <sup>[10]</sup> For instance, digital media interventions which are interactive and tailored (meaning that users receive tailored feedback in response to the input of person-specific relevant data), as active engagement with intervention and receipt of information that is of user-specific relevance is more likely to enhance consolidation of learning and behaviour change <sup>[10,12]</sup>

In this era of social media, commonly referred to as web 2.0,<sup>[13]</sup> acts such as meeting partners online, pornography online sexting (the sending of sexually explicit materials) are unlikely to convey positive sexual health messages.<sup>[10]</sup>

It is not unusual for social media users to be exposed to the risks, excessive masturbation, unprotected sexual act and multiple sexual partnerships at an early age.<sup>[11,14]</sup> This trend had brought concerns among school authorities, parents, communication experts and other relevant stakeholders on the benefits and potential risks facing undergraduates, as they engaged in online social networking to meet their social and educational needs.<sup>[15,16]</sup>

Not much is known of the relationship between the social media use and sexual practices among undergraduates in Solan, Himachal Pradesh. [2,11] Information about sexual practices is essential to the design and assessment of digital interventions to

improve sexual health.<sup>[17,18]</sup> The findings of this study will help educate the populace on healthful use of social media and as such bridge the knowledge gap on the associations between social media use and risky sexual practices. It will provide information for policy makers, government and non-government organizations working on young undergraduates sexuality issues. It is against this backdrop that the researchers designed this study to determine the use of social media and its association with risky sexual practices among undergraduate students in a private faith-based tertiary medical educational institution.

#### Method:

The present cross sectional descriptive study was done at MM Medical College & Hospital which was established in 2013 as a constituent Institute of Maharishi Markandeshwar University, Solan. The study population comprised of all the medical students who were undertaking an undergraduate regular program at MMMC&H for at least one year.

The sample size was determined using the formula  $n=Z^2pq/d^{2}$  [19] where n= minimum sample size: Z=standard normal deviate at 95% confidence interval set at 1.96; p=prevalence in a previous study; q=1 -p; d=degree of precision (0.05); Thus using a prevalence from previous study done at Osogbo metropolis, Nigeria, which showed 73.5% as the prevalence rate, <sup>[2]</sup> the sample size was estimated as 269.0. Assuming 10% non response rate, the final sample size was approximately 300students.Simple random sampling technique using a table of random numbers, was applied to select 300 participants from 3000 medical under-graduates.

Data were collected using pre-tested, semistructured questionnaires developed from review of relevant literatures. All questions were written in English language and pre-tested at a site different from the study site. Thereafter the instruments were reviewed and necessary corrections were made.

Variables comprised of socio-demographic variables such as respondent's age, gender, religion,

Social media and sexual practices...

tribe, etc., awareness, reason for social media use and various sexual practices. The data were edited and entered into the computer. Data cleaning was done by carrying out range and consistency checks. Descriptive and analytical statistics of the data were carried out using International Business Machine/statistical package for social sciences (IBM/ SPSS) Windows version 22.0 (22). Descriptive data were presented as simple frequencies and percentages. Tests of statistical significance were carried out using Chi square tests; p value of  $\leq 0.05$ was considered statistically significant.

#### **Results:**

Three hundred medical under-graduates were approached and questionnaires were distributed. The response rate was thus analyzed to be 100%. The mean age of respondents was  $21.85 \pm 2.63$  years. The modal age group was 21-26 years (40.7%), majority (64.7%) were females, were never married (93.7%) and were Christians (97.3%). (Table-1)

Characteristics	Frequency (N=300)	Percentage (%)					
Age (in y	vears)						
16 - 20	110	36.7					
21 - 25	149	49.7					
26 - 30	41	13.6					
No	139	66.19					
Gende	er						
Male	106	35.3					
Female	194	64.7					
Marital status							
Never married	281	93.7					
Currently married	17	5.7					
Divorced/separated	1	0.3					
No response	1	0.3					
Religi	on						
Christianity	292	97.3					
Islam	7	2.4					
Traditional religion	1 0.3						
Ethnicity							
Rawat	206	68.9					
Uniyal	35	11.7					
Hausa	8	2.7					
Others	80	16.7					

# Table 1: Distribution of the respondents by socio-demographic characteristics

Majority of the respondents have heard about social media (n=299, 99.7%) and majority of the respondents have received information

from friends/peers (79%). The commonest reason for non-use of social media for sexually explicit content was lack of interest (54.3%).

Variables	Frequency (N=300)	Percentage (%)					
Sources of informa	tion on Social media*	I					
Friends/Peers	237	79					
School	155	51.7					
Television	121	40.3					
Siblings	102	34					
Radio	82	27.3					
Printmedia	62	20.7					
Parents	55	18.3					
No	139	66.19					
Ever used Socia	l media (N =299)	·					
Yes	286	95.7					
No	13	4.3					
Reasons for use of social media*(n=286)							
Access news	208	72.7					
Academics	182	63.6					
Sex movies and pornography	173	60.5					
Access sexual health educational content	111	38.8					
Emails	111	38.8					
Games	105	36.7					
Sports	31	10.8					
Access social media for	sexually explicit content						
Yes	173	57.6					
No (for other reasons)	113	37.7					
Commonest reason for not accessing Social	media for Sexually explic	it content (n=113)					
Not interested	62	54.9					
It is inappropriate	25	21.8					
It is against my faith	20	18					
Restrictions on campus	3	2.7					
It is addictive	2	1.8					
Do not own a smartphone	1	0.8					
Multiple Responses							

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Sexual practices	Frequency (N=153)	Percentage (%)					
Ever ha	d sex						
Male	58	37.9					
Female	95	62.1					
Age at sexual de	but, (n=153)	-					
<5	2	1.3					
6-10	5	3.3					
11-15	27	17.6					
16-20	98	64.1					
21-25	17	11.1					
26-30	4	2.6					
Sexually active (had	sex in<3 months)						
Yes	126	82.4					
No	27	17.6					
Form of sexual acts res	pondents practice*						
Vaginal/penile	119	77.7					
Oral sex	85	55.6					
Sexting	58	37.9					
Masturbation	47	30.7					
Anal sex	36	23.5					
Type of sexual acts res	spondents practice						
Penetrative	100	65.4					
Non penetrative	15	9.8					
Not specific	38	24.8					
Type of sexual p	artnerships*	1					
Steady partner (Boy/girlfriend)	113	77.7					
Casual contact	68	44.4					
Partner met on social media	60	39/2					
Commercial sex worker	32	20.9					
Number of sexual partnerships							
Single	97	63.4					
Multiple	56	36.6					
Ever used condoms							
Yes	124	81.1					
No	29	18.9					
Frequency of c	Frequency of condom use						
Consistently	59	47.6					
Occasionally	64	51.6					
No response	1	0.8					

# Table 3: Distribution of respondents by sexual practices

\* Multiple Responses

On analysis, there was no statistically significant association between gender and ever having sex

(χ<sup>2</sup>=0.90329, p=0.301). (Table-4)

		Ever had sex	Test statistic (χ2)	p value	
Gender	Yes(%)	No (%)	Total (%)		
Male	58 (19.3)	48 (16)	106 (35.3)		0.301
Female	95 (31.7)	99 (33)	194 (64.7)	0.9032	
Total	153 (51)	147 (49)	300 (100)		

Table 5: Association of sexual practices with social media use for sexually explicit content

Sexual practices	Accesses	χ2 test , p value					
(n=153)	Yes(%)	Yes(%) No (%) Total (%)					
		Ever had sex					
Yes	58 (19.3)	90 (30)	106 (35.3)				
No	95 (31.7)	83 (27.7)	194 (64.7)	0.171 (0.6795)			
Total	153 (51)	173 (57.7)	300 (100)				
	Sexually acti	ve (had sex in<3	months)				
Yes	84 (54.9)	42 (27.5)	126 (82.4)				
No	7 (4.6)	20 (13)	27 (17.6)	15.27 (0.000*)			
Total	91 (59.5)	62(40.5)	153 (100)				
		Type of sexual a	cts				
Penetrative	68 (44.4)	32 (21)	100 (65.4)				
Non penetrative	7 (4.6)	8 (5.2)	15 (9.8)	8.644 (0.003*)			
Not specific	16 (10.5)	22 (14.3)	38 (24.8)				
Total	91 (59.5)	62 (40.5)	153 (100)				
	Num	iber of sexual pa	artners				
Single	73 (47.7)	24 (15.7)	97 (63.4)				
Multiple	18 (11.8)	38 24.8)	56 (36.6)	27.203 (0.000*)			
Total	91 (59.5)	62(40.5)	153 (100)				
Use of condoms							
Yes	78 (51)	46 (30.1)	124 (81.1)				
No	13 (8.5)	16 (10.4)	29 (18.9)	2.0025 (0.157)			
Total	91 (59.5)	62(40.5)	153 (100)				
* Statistically significant ass	ociation - p<0.05,	χ2- Chi square t	est				

#### **Discussion:**

This cross-sectional descriptive study determined the use of social media and its association with sexual practices among undergraduate medical students. In this study, all but one respondent was aware of social media as compared to 100% awareness in other studies.<sup>[22,23]</sup>On the source of information about social media, more than seven in every ten of them heard from friends/peers followed by schools. This is in tandem with the findings of other studies.<sup>[24,25]</sup>

From the findings of this study, about 95.3% of respondents reported ever use of social media and the primary reason was access to news, academics, sex movies and pornography. This is also in keeping with the findings of other studies. <sup>[23,24]</sup> This study found that majority of the respondents accessed social media for sexually explicit content. Similar reports have been made elsewhere. <sup>[26]</sup> The commonest reason for non-use of social media for sexually explicit content was lack of interest which is corroborated by the Media Practice Model, which posits that media use is selective with users focusing on content related to the predominant issues of interest to them. <sup>[26]</sup>

Our study found that the mean age at sexual debut was  $17.44\pm2.63$  years. This finding relates with the findings of other studies.<sup>[27,28]</sup> The current study reported that about 42% (n=126) respondents have engaged in a sexual act in the preceeding three months of the survey. This finding is consistent with the report in another study.<sup>[29]</sup>

It is pertinent to note that though 81.1% of the respondents who ever had sexual intercourse reported the use of condoms, only less than half of them were consistent. This practice has also been reported by other studies.<sup>[29]</sup> On the other hand, more than seven in every ten of the respondents who ever had sex reported having steady partnerships. Though there were variations in proportions, this finding agrees with reports elsewhere. <sup>[36]</sup> About 39.7% of the respondents who ever had sex, had partners met up on social media, while 20.9% patronized commercial sex workers, as reported in other studies.<sup>[2]</sup>

In the present study, there was no statistically significant association between ever having sex and gender. However, more female students were found to engage in sexual acts than the males as in other studies.<sup>[30]</sup>

The index study found statistically significant associations between use of social media for sexually explicit content and variables such as being sexually active; type of sexual acts practiced, and number of sexual partners. This finding is consistent with the findings of several studies which showed that use of social media for sexually explicit content had influences on users "sexual practices albeit negatively.<sup>[2,5]</sup> Implicated in this trend, were factors like the media; especially the social media. Moreover, observationallearning theory suggests that the viewer's characteristics and behavior could be influenced by the character or behavior observed. It thus indicates that exposure to sexual contents on the media could influence reciprocate behavior.<sup>[11]</sup> Such content is often discussed and exchanged within social networks.<sup>[26]</sup>Our study found no statistically significant association between use of social media for sexually explicit content and use of condoms. While there is dearth of studies on this subject, similar finding was cited by a group of authors.<sup>[31]</sup> Further studies are needed in this area.

#### **Conclusion:**

This study examined pattern of social media use among undergraduate students in a private university in Solan, Himachal Pradesh and found high awareness of social media with source of information mostly via friends/ peers. Access to news, academics and viewing sex movies and pornography were the primary reasons for use of social media. Also, accessing sexually explicit content contributes to risky sexual practices. There was no association between ever had sex and gender. There is need for improved multi- sectoral measures (formal comprehensive sex education, peer education programs, school mini-media clubs and targeted behavior change intervention), Media and internet literacy education to control viewing of social media for sexually explicit content, while ensuring that young people's access to sexual health educational content is not compromised.Students who are heavy users, should moderate the use of the sites to avoid addiction and create a balance between their offline and online lives while using the sites."This ensures that they assess the quality and source of material that would encourage academic learning and enable them to tackle against the untoward effects of malexposures.

Limitations and strength of the study: Reporting bias and recall bias could result from this study. These biases however, would have been minimized by the self-administration and anonymity entrenched in data collection, assuring the students that their answers would be strictly confidential and be used for research purposes. First, results are based on self-reported, personal data that could be subject to response bias due to social desirability resulting from participants completing surveys in their school/program environment. This was attenuated by research assistants, not affiliated with the program, administering the surveys. Additionally, the use of personal laptop computers and audio capability increases data dependability. A major strength of this study is in the high response rate (100%) achieved.

#### **Declaration:**

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# Comparison of Predictors of Mortality between Young and Elder Covid-19 Patients Admitted in Covid-19 Designated Tertiary Care Hospital

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#### Abstract:

**Introduction:** The outbreak of Covid-19 has led to a health emergency and economic crisis worldwide. Mortality in productive age further worsens the crisis, so it is important to understand reasons for death in productive age group. **Objective:** To identify predictors of mortality and to compare the intensity of rise in inflammatory markers amongst young Covid-19 deceased in comparison with elder Covid-19 deceased. Method: Record based study was conducted among all Covid-19 infected patients (n=3131, 209 deceased and 2922 recovered patients) admitted in tertiary care hospital. Clinicepidemiological markers of younger (18-45 years) deceased were compared with elder deceased (>45 years). Mann–Whitney test and the Chi-square test for significance were used. Bivariate multiple logistic regression was used to identify predictors of mortality among younger and elder Covid-19 patients. Results: Case Fatality Rate (CFR) in Covid-19 infected patients was 2.4% and 9.7% amongst younger and elder group respectively. (Odds Ratio:8.83, 95% Confidence Interval 5.9-13.2; p <0.001). Biomarkers were raised and similar in both groups except Neutrophil Lymphocyte Ratio (NLR) was significantly higher in elder deceased while Lactate Dehydrogenate (LDH) was significantly higher in younger deceased. Conclusion: Males had higher CFR than females after 45 years of age, which was due to co-morbidity. Reaching late to the health care facility and high LDH were predictors in younger decedent, while male gender, co morbidities and high NLR were more important predictors in elder group. **Recommendation**: Monitoring Covid-19 patients by measuring Oxygen saturation with oxymeter after 6 meter walk test may detect hypoxia early and help patient to reach health facility timely.

Key words: Bio markers, Covid-19, Female Case fatality, Predictors, Young Covid-19 deceased

#### Introduction:

In 21st century, combination of modern technology and medicine started conquering health problems step by step by identifying promising solutions. COVID-19 patients who are aged, hypertensive or diabetic, are more likely to develop a more severe course and progression of the disease.<sup>[1]</sup> About 15.1% deaths are below 45 years age group. Although case fatality rate in this productive age group is less, deaths amongst young and healthy

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people contribute far more quality-adjusted lifeyears lost than deaths in elderly individuals with preexisting morbidity.<sup>[2,3]</sup> The single death of person in productive age group can have deep impact in the family as well as nation.

Premature deaths and hospitalization adversely affect economic growth and development.<sup>[4]</sup> Gujarat, reported more than 90000 Covid-19 cases and 3000 Covid-19 deaths.<sup>[5]</sup> Marked shift in lifestyle, urbanization, and oil and sugar rich dietary habits have pushed ethnic Gujarati people to the forefront as contributors to Cardio Vascular Disease (CVD) risk factors.<sup>[6]</sup> Prevalence of Diabetes Mellitus (DM), in Gujarat is 9.8%.<sup>[7]</sup> The knowledge of reasons of Covid-19 mortality rates amongst young adults can help in guiding different management strategies for the pandemic.

# **Objectives:**

# **Primary objective**

- To identify predictors of mortality amongst young in comparison with elder Covid-19 deceased.

#### **Secondary objectives**

- To evaluate clinical status on admission in young decedents
- To compare commonest complications and the intensity of rise in inflammatory markers of amongst young Covid-19 decedents in comparison with elder Covid-19 decedents.
- To identify risk factors and their association with Covid-19 mortality amongst young patients in comparison with elder deceased

#### Method:

Study design-Record based study was carried out after getting clearance from Institutional Review Board(IRB). IRB approved to study records of patients aged 18 years and above.

Study setting- Information was taken from hospital records of Covid-19 positive patients admitted in Covid-19 designated 1200 bedded tertiary care hospital run by the Ahemedabad Municipal Corporation. Study duration- Records of all Covid-19 positive patients admitted between 17<sup>th</sup> March 2020 (first reported case) and 15<sup>th</sup> June 2020 were included.

Inclusion Criteria-Records of all Covid-19 positive patients aged 18 years and above admitted in hospital during study period. Patient with Covid-19 infection diagnosed and managed as per the guideline issued by Indian Council of Medical Research(ICMR) guideline.<sup>[8]</sup> As per the guideline patient with positive report by RTPCR/ Rapid Antigen testing was considered as Covid-19 infected patient irrespective of patient tested positive before (outside hospital laboratory) or after hospitalization.

Exclusion criteria-Patients who were discharged or expired after  $15^{th}$  June 2020 and voluntarily transferred to private hospitals were excluded from the study.

Total 5441 patient were admitted having Covid-19 infection. After applying exclusion criteria, total sample size of Covid-19 positive admitted patients was 3131(2922 recovered and 209 deceased).

The hospital has electronic record keeping system. Information from record of each study subject was taken after taking permission of concerned authority. Swab Positivity Rate (SPR) was calculated as percentage of nasopharyngeal swab tested positive by RTPCR test out of total nasopharyngeal swab examined. Complications were identified from the clinical and laboratory records. Intensity of inflammatory markers in decedents was evaluated.

# Defining young and elder group-

Interest of currents study is to identify factors associated with death in young Covid-19 patients in comparison with recovered young as well as decedent elder Covid-19 patients. Lack of literature regarding cut off age defining young Indian Covid-19 patients, cut off age was decided from based on data from current study. From the records included for the study, it was found that an average age of recovered patients was (41.6 years, SD 17.2) which falls in class interval of 40 to 45 years age group. Hence, 45 years of age was kept as cutoff to group young and elder patients. To identify reasons for death in young patients, deceased aged 45 years or less (younger) were compared with deceased aged more than 45 years (elder).Out of total (209),29 deceased were below 45 years of age.

Swab Positivity Rate (SPR) was calculated as percentage of nasopharyngeal swabs tested positive by RTPCR test out of total nasopharyngeal swabs examined. Low Oxygen saturation (SpO2) at the time of admission was taken as indicator of hypoxia. Patients who needed invasive oxygen therapy (BiPAP, Hi flow nasal oxygen, invasive ventilator) were categorized as severely hypoxic.

# Analysis-

To avoid confounding, parameters in both groups were calculated taking subset/s of mortality as numerator and subset/s of recovered Covid-19 as denominator in respective groups.

Quality check of records- Hospital has electronic record system maintained by IT department. Each patient is given unique identity number. System identifies this number and clinical and laboratory records are linked from the source of data generation. At the time of death or discharge all such records are reviewed by treating consultant while making discharge or death summary.This minimizes errors in record keeping.

# Statistical analysis-

SPSS software version20 was used for statistical analysis. Descriptive statistics included frequency analysis (percentages) for categorical variables and mean ± Standard Deviation (SD) or median for continuous variables. Kolmogrov- Sminov test for normality was applied to each variable before applying statistical test. Based on this comparison between recovered and deceased was determined by Mann–Whitney U-test (continuous variables) and the Chi-square test (categorical variables). Parameters in the group of decedents aged <45 years and above 45 years were calculated and compared taking subset/s of mortality as numerator and subset/s of recovered Covid-19 as denominator in respective groups. Predictors were identified by finding association of risk factors with death using binary multiple logistic regressions in both groups separately. The statistical inference was made at significance level of 0.05 (twotailed).

#### **Results:**

With pandemic alert, the city started RT-PCR testing of individuals returning from foreign countries in the hospital since 6<sup>th</sup> February 2020. The first reported case having Covid-19infection in the city as well as of hospital was reported on 17<sup>th</sup> March. On 28<sup>th</sup> March 2020 the first case (deceased afterward) without any history of positive contact of traveler from affected country (suspected probable indigenous) was reported. Out of total 3131 Covid-19 positive patients, 771 (24.6%) gave history of contact with positive person. Total 93 patients were frontline workers (health care workers, police, volunteer) during Corona pandemic that contracted infection during their Covid-19 duty out of which 4 sacrificed their lives.

# Epidemiological scenario-

Swab Positivity Rate (SPR) was calculated as percentage of nasopharyngeal swab tested positive by RTPCR test out of total nasopharyngeal swab examined. Rapid antigen testing was not introduced during study period. As depicted in(Figure 1), Swab Positivity Rate(SPR) was lowest below 25 years age group (43.2%) afterwards it was increasing in successive age group reaching to the peak 71.7% (46 to 55 years) then after SPR was reduced to 60% in >65 years age. Similar trend was seen in both sexes. The Case Fatality Rate (CFR) was increasing with age. CFR doubled every 10 years increase in age after 35 vears (Graph-1). Overall CFR (6.7%) was comparable with WHO report (6.4 %).<sup>[9]</sup> Deceased patients were significantly older (59.4 years, SD-15.02) than the recovered (41.6 years, SD 17.2) group (p<0.001).

Covid-19 infected patients with age >45 years were associated with 8.83 folds significantly increased risk of mortality as compared to patients with age <45 years (unadjusted OR 8.83 : 95% CI 5.9-13.2; p < 0.001). Although CFR in young infected was lower, their absence has severe consequences for surviving family members and may curtail overall development of their children.





Female patients were 38.8%(n=1214) of total Covid-19 positives admissions and 28%(n=59) of total deaths. There was no significant difference in swab positivity between male & female but overall females (4.9%) had lower CFR than males (7.8%). Although females are contributing 28% of total death, deceased females were 6 years younger than deceased male.

The female survivor (average age-40.3 years ,SD-17.9) and deceased female (54.8 years,SD-14.9) were significantly younger than male survivor(42.5 years ,SD-16.7)( p<0.001) and deceased males(61.3 years,SD-14.8)(p<0.001).

#### **Clinical scenario:-**

Proportions of asymptomatic patients were 13.1% (n=226) and 8.8% (n=124) in young and elder group of patients, respectively. Amongst all symptomatic, top four common symptoms was fever, dry cough, breathlessness, weakness (diarrhea in few cases) in both the groups.

Median duration between onset of symptom and reaching first health facility in recovered and deceased patients were between three days and five days respectively. Mean (SD) duration of breathlessness in recovered and expired patients were 0.81 day (1.2 days) and 2.3 day (2.7 days) respectively. It was statistically significant (p<0.001). Nearly 85% of deceased had  $SPO_2$  level below 90%. These findings indicate that fever was usually an ignored symptom to seek health facility while difficulty in breathing was the main reason to reach to the hospital. Deceased admitted with poor general condition were45%, among them five had Diabetic Ketoacidosis on admission.

'The presence of co morbidities is associated with poorer outcomes in Community Aquired Pneumonia' which holds true for Covid-19, too. More than half of elderly(n=756,54%) and 196 younger (14%) Covid-19 positive patients had at least one co morbidity, out of these 10.2%(n=20) younger and 161 elder deceased (21.3%) expired (table 1). Absolute number of Covid-19 positive patient suffering from Chronic Kidney Disease (CKD), Ischemic Heart Disease (IHD) and Cerebro-Vascular Stroke (CVS) were less but case fatality rate was high.(Table 1).

Case Fatality Rate (CFR) in younger and elder decedents without any co morbidity was 0.6% and 2.9% respectively. Hypertension (5.4% of young, 31.3% elder) followed by Diabetes type 2 (3.5% of young, 23% elder) were the commonest co morbidity in both younger and elder group CFR was highest in younger decedents with Diabetes Mellitus (18%) followed by those with history of Ischemic heart disease (IHD) (15.4%) whereas amongst elder decedent CFR was highest with Chronic Kidney Disease (CKD) (50%) followed by IHD(32.5%).All younger patients with Chronic Kidney Diseases were recovered.

Chest X ray revealed 173 (84.3%) deceased had bilateral Mid Zone or Lower zone pneumonia. A study from China reported 80% of Covid-19 patient had ground glass opacity. Bilateral Xray changes were seen in 73.2% deceased among them 71.5%required O2 therapy.<sup>[10]</sup>

High Flow Nasal Oxygenation and Bi PAP were means of Non Invasive Ventilation to postpone intubation. Out of total patients put on ventilator (n=213), only 13 recovered out of these 4 were

Sr.	Co morbid	<u>&lt;</u> 45 years frequency		>45 years frequency		Total frequency		CFR (%)		
NO.	status	R**	D*	R**	D*	R*	*D*	<=45 year	>45 year	Total
1	Chronic Kidney Disease	3	0	13	13	16	13	0.0	50.0	44.8
2	Ischemic Heart Disease	11	2	78	37	89	39	15.4	32.2	30.5
3	Diabetes Mellitus	50	11	297	101	347	112	18.0	25.4	14.4
4	Hypertension	86	7	429	112	515	119	7.5	20.7	18.8
5	Chronic Lung Disease	22	1	23	5	45	6	4.3	17.9	11.8
6	Miscellaneous	33	2	57	26	90	28	5.7	31.3	23.7
7	No Co-morbidity	1480	9	570	19	2050	28	0.6	3.2	1.3
8	1 Co-morbidity	140	6	328	49	468	55	4.1	13.0	10.5
9	2 Co-morbidity	33	10	212	57	248	67	23.3	21.2	21.5
10	>=3 Co-morbidity	3	4	55	55	58	57	57.1	50.0	50.4
	Total	1699	29	1226	180	2925	209	1.7	12.8	6.7

Table 1: Com	narison of case	e fatality specific	to existing co	morbidity between	voung and	elderly group
Tuble Li com	pui ison oi cust	- intuity specific	c to chisting to	morbinity between	young und	clucity group

\*\*R- Recovered \*D- Deceased

Figure	2:	Comp	lications	in	Decedents
0		I'			



Dick factors	Adjusted Odds Ratio (Confidence interval)			
RISK factors	Age 45 years & less	Age > 45 years		
Gender= Male (Female- Ref)	0.45 (0.1-2.5)	2.02 (1.1-3.6)		
On admission low Oxygen saturation (Room air &Non invasive Oxygen Ref)	2586.7 (400.9-16690.3)	238.8 (133.3-426.7)		
Hypertension (Non hypertensive- ref)	0.8 (0.1-6.3)	3.6 (0.9-2.7)		
Diabetes Mallitus (Ref-Non diabetic)	4.96 (0.6-86.7)	1.6 (0.9-2.7)		
Comorbidity (Ref- no comorbidity)	11.4 (1.5-86.7)	13.1 (6.99-24.4)		

Table 2: Comparison of association	of risk factors with Covid-19 mortality between young
and elder deceased	

younger survivors. All deceased except two were intubated as resort to improve their Oxygenation.

Complications- The commonest complication was Septicemia (n=146,71 $\cdot$ 2%) out of them 76 (37% of total) developed Cytokine storm. Excessive production of pro inflammatory cytokines aggravates Acute Respiratory Distress Syndrom (ARDS) and widespread tissue damage resulting in multi-organ failure and death.

Complication in younger deceased without co morbidity were related to septicemia, coagulopathy and acute hepatic and renal injury secondary to septicemia.(Figure 2). Younger deceased with co morbidity had both septicemia and micro thrombus related of complications but lesser extent for thrombotic complications as compared to elder deceased (irrespective of type & number of co morbidity).

Apart from ARDS, Acute Kidney Injury and Disseminated intravascular coagulation were the last events before death and all deceased could not survived more than 3 days after developing them. Two deceased collapsed suddenly in the high dependency unit. Of these two, one younger decedent collapsed due to severe cytokine crises (20 years age) and the other elder decedent succumbed due to Cardiogenic shock.

#### $Association\,of\,risk\,factor\,with\,Covid-19\,mortality$

To identify independent association of risk factor with Covid-19 mortality binary multiple logistic regressions in both groups was used separately in both the groups.Patients who needed invasive oxygen therapy (BiPAP, Hi flow nasal oxygen, invasive ventilator) were categorized as severely hypoxic. At the time of admission, patients with severe hypoxia were compared with patients who could maintain oxygen saturation more than 95% at room air or low pressure non invasive oxygen mask.

Considering Hypertension and Diabetes important risk factors and contributors in causation of CKD, IHD and CV stroke hence in each group binary logistic regression was applied using five variablesgender, status of Oxygen saturation (SpO2) on admission along with Hypertension and Diabetes. (Table 2).

Since number of patient maintained SpO2 on room air were very less as compared to patients required non invasive oxygen in both groups of deceased, odds ratio came too high for condition of admission.

# **Discussion**:

Covid-19 deceased age was 9–10 years lower (59.4 years,SD-15.02) than Covid-19 deceased from

Wuhan (deceased-70.2 $\pm$ 7.7 years Survivor-56.0 $\pm$ 13.5 years) in non white decedents from USA (median 72 years).<sup>[10,11]</sup> In present study one or more comorbidities was reported 86.2% decedent which was higher than United States and China (three fourths of decedents). Our study 53.6% deceased had Diabetes while USA (39.5%) and China reported (28.6%).<sup>[11,12]</sup>

Case Fatality Rate (CFR) in COVID-19 infected patients was 2.4% and 9.7% amongst younger and elder group respectively. Systemic review & metaanalysis reported 15.4-folds significantly increased risk of mortality in COVID-19 infection amongst patients with age  $\geq$ 50 years as compared to patients with age <50 years.<sup>[13]</sup>

The average duration between breathlessness and admission was 3.1 days in young decedents as compared to elder deceased (>45 years) 2.1 days. 60% of younger deceased as compared to 54% elder deceased had  $O_2$  saturation <85% or came with oxygen support on admission. None of younger deceased had stable condition on admission and 15 had to put on ventilator within 24 hours of admission, where as recovered patient in same age group only 1.6% needed non invasive oxygen support on admission. This indicates that younger decedent reached late to the health care facility may be due to happy hypoxia.

In present study, the median durations between onset of symptoms and reaching first health care facility among recovered and deceased patients were three days and five days, respectively. These averages were less than reported by Wuhan city was (mean $\pm$ SD =9.7 $\pm$ 4.3).<sup>[11]</sup> This may be due to negligence of symptoms or rapid worsening of condition due to higher prevalence of co morbidities in the population in present study.

# **Complications:**

In COVID-19 infection, patients developed complication related to Septicemia or thromboembolism.<sup>[14]</sup>

Myocardial injury, Coagulopathy and Acute coronary syndrome occurred in 36.1%, 19.5% and

16% of deceased respectively. Myocardial injury in COVID-19 infection is due to Septicemia and Hypoxemia.<sup>[15,16]</sup>

In-hospital mortality was significantly higher in patients with myocardial injury than in patients without myocardial injury (14 (60.9%) vs. 8 (25.8%), P=0.013).<sup>[13]</sup>

#### Biomarkers in COVID-19 deceased patients-

Biomarkers in decedents were studied to facilitate selecting treatment modalities. Acute Respiratory Distress Syndrome (ARDS) was observed in all decedents. Hadith Rastad et al reported,  $PaO_2 \ge 80$ mm/Hg in deceased patient was the only factor that was associated with patients' survival.<sup>[11]</sup>

Neutrophil : Lymphocyte Ratio (NLR) was 5 or more in 97 deceased out of these patients 88 had lymphocyte count five or less. Biomarkers were raised and similar in both groups except Neutrophil Lymphocyte Ratio (NLR) was significantly higher in elder decedent while LDH was significantly higher in younger decedents.(table-3)Increase or decrease of Lactate Dehydrogenate (LDH) was indicative of radiographic progress or improvement.<sup>[17]</sup>

Therefore, in younger patients especially without co morbidity anti inflammatory agents might play major role rather than thrombolytic therapy to improve CFR. Henrery et al in his met analysis observed that NLR >=2.48 is the predictive prognostic biomarker of poor out come due to sepsis.<sup>[14,18]</sup>C Reactive Protein (CRP) was progressively raised after 3rd median day of admission in majority of decedents.

# Comparison of predictors of Mortality between young and elder Covid-19 deceased patients

# Gender difference:

Gender difference in younger age group CFR was similar (Female-1.8, Male-1.6, p=0.9) whereas in elder age group males hadabout twice the risk of death from COVID-19(CFR =female- 9.2, Male-14.9, p<0.001) (Table 3). Findings of Covid-19 associated data from 45 countries revealed higher risk of death

Sr.	Sr. Diamarkana		45 years & less			above 45 years		
No.	Biomarkers	N	Mean	SD	N	Mean	SD	value
1	C Reactive Protein (mg/L)	19	50.1	78.7	121	63.4	100.5	0.92
2	PaO2(mm/Hg)	15	73.7	24.7	67	72.4	28.3	0.88
3	PaCO2 (mm/Hg)	10	56.3	19.4	43	59.6	21.3	0.65
4	HbA1c (%)	25	7	2	180	6.8	1.9	0.68
5	Neutrophil LymphocyteRatio	15	13.2	8.4	88	22.6	21.8	0.04
6	D dimer(mg/ml)	11	3.5	1.2	86	3.3	1.2	0.36
7	Platelets(no./cmm)	2	86.5	19.1	17	146.8	89.1	0.23
8	Ferritin(ng/ml)	9	1152.8	617.1	62	1223	909.7	0.93
9	Lactate Dehydrogenate (unit/l)	7	1158.9	709.1	56	850	825.2	0.04
10	Polymerase Chain Reaction (ng/ml)	7	4.5	6.9	31	8.2	28.9	0.68

Table 3: Compariso	on in intensity of bi	omarkers between	voung and elderly de	eceased
Tuble of comparise	In minicemoney of Di	omai nei b between	young und crucity ut	<i></i>

\* Mann Whitney U test

COVID-19 infection for men is significantly higher than that of women particularly in older individuals.<sup>[19]</sup>

In younger group co morbidity was significantly high(Chi Square =6.9,d.f=1,p<0.01) in females (76.9%) than males(56.3%), whereas in elder group co morbidity was significantly high( Chi Square =14.2,d.f=1,p<0.001) in males (91.1%) than females (84.4%). It indicates that gender difference in CFR in our study may be due to co morbidity rather than gender itself. Men and women have the same susceptibility; men may be more prone to have higher severity and mortality independent of age and susceptibility, leading to a range of hypotheses, from lifestyles to differences in chromosomal structure.<sup>[20-22]</sup>

# **Conclusion:**

Male gender, Hypertension and Neutrophil Lymphocyte Ratio (NLR) were more important predictors in elder group. Whereas in younger age group, gender did not have any influence in mortality but Diabetics had 5 times higher risk of mortality and LDH was significantly raised as compared to elder age group. Overall an older age was non modifiable risk factor for worst outcome in patients with COVID-19 whereas gender difference in CFR was due to presence of co morbidities.

**Recommendation:** Monitoring Covid-19 patients by measuring O2 saturation with oxymeter after 6 meter walk test may detect hypoxia early and help patient to reach health facility timely.

# **Study Limitation:**

1. Various inflammatory and immune markers in decedents were not carried out for all patients. Therefore our conclusion based on available biomarkers was limited to few patients instead of total study population.

2. Patients with moderate to severe illness were admitted in the hospital hence inference made from

hospital based study may not fully represent community scenario.

#### **Declaration**:

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Conflict of Interest: Nil

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# A Cross-Sectional Study on Prevalence and Socio-Demographic Correlates of Hypertension in Peri-urban Community of Kashmir Valley

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#### Abstract:

**Introduction:** Hypertension, also known as high or raised blood pressure, is a global public health issue. It's among the top ten leading causes of death in the world. Poor compliance to anti-hypertensive therapy is usually associated with bad outcome of the disease and wastage of limited health care resources. **Objective :** To assess the prevalence, socio-demographic correlates and treatment compliance of the hypertensive patients. Method: This community based cross sectional study was conducted in a peri-urban area in the month of May 2019. This study was conducted in relation to May Measurement Month, an Initiative which was first observed by international Society of Hypertension in May 2017. This area is divided into six Mohallas from which two Mohallas were selected randomly. All households from the selected Mohallas were included in this house to house survey. A total of 1076 subjects above the age of 15 years participated in the study. The analysis of data was done using SPSS version 20.00 and standard statistical test like chi square ( $\chi^2$ ) was applied where ever required. **Results:** Over all prevalence of high blood pressure was found to be 28.8% in study population with 82.6% known hypertensives and 17.4% detected with raised BP for the first time. The overall compliance to treatment in known hypertensives was 34.4%. **Conclusion:** A very low treatment compliance level was observed in the study participants which needs redressal by way of mass awareness campaigns, as well as individual counseling for Behaviour Change Communication.

Keywords: Cardiovascular Disease, Compliance, Hypertension, Treatment.

# Introduction:

Currently, developing countries like India are in a transitional phase, an epidemiological transition from a phase of predominantly infectious disease burden to a phase of triple burden of infectious diseases, chronic non-communicable diseases, and injuries. This is largely due to demographic, lifestyle, nutritional and environmental changes.<sup>[1]</sup> According to World Health Organization (WHO) 2017 estimates on Non Communicable diseases (NCDs), NCDs were estimated to be responsible for about 61% of all deaths in India. High Blood Pressure (BP) is a major public health problem in developing countries around the world and is one of the most important modifiable risk factors for Cardio Vascular Diseases (CVDs).<sup>[2]</sup>

Hypertension significantly contributes to the burden of heart disease, stroke and kidney failure and premature mortality and disability. It disproportionately affects populations in low and

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middle income countries where health systems are weak .The increasing prevalence of hypertension is attributed to population growth, ageing and behavioral risk factors, such as unhealthy diet, harmful use of alcohol, lack of physical activity, excess weight and exposure to persistent stress.<sup>[3]</sup> Early diagnosis and treatment of hypertension as a secondary level of prevention forms an effective tool for preventing complications and thus reducing morbidity and mortality due to hypertension. This can be achieved by screening for early detection and use of effective medical therapies for management of hypertensives. It has been seen that poor adherence to antihypertensive therapy has proven to be one of the biggest obstacles in the control of high blood pressure. It also compromises the efforts of the health care system, policy makers and health care professionals in improving the health of populations.<sup>[4]</sup> Failure of compliance to treatment causes medical and psychological complications of the disease, reduces patients' quality of life, wastes health care resources and erodes public confidence in health systems.<sup>[5]</sup>

Hypertension is a disease which requires continuous self-management, such as life-long medicine treatment and lifestyle improvement. Treatment adherence can be defined as carrying out actions which corresponds to clinical treatment of specific diseases <sup>[6]</sup>, which prevent injury from aggravation of symptoms and disease and help control patients' current situations, making a positive influence on patients' satisfaction of life.<sup>[7]</sup> Hence, in 2016 the International Society of Hypertension (ISH) announced its intention to initiate and lead a global campaign designed to raise awareness of the importance of BP and to act as a pragmatic temporary solution to the shortfall in BP screening programmes. This campaign, May Measurement Month (MMM) 2017, was designed to expand on and standardize the activities of the annual World Hypertension Day (17 May) which had been an international event since 2005.<sup>[8]</sup> The initial MMM survey took place in 2017 in 80 countries, screening over 1.2 million adults.<sup>[9]</sup>

The present community based study was an endeavor in this direction to implement the MMM strategy on a smaller scale in a peri-urban locality. This included screening people for hypertension and at the same time using this as an opportunity to create awareness about the disease as well as timely intervention in those needing further care.

#### **Objectives:**

(1) To assess the prevalence of hypertension in study population.

(2) To determine the socio-demographic factors associated with hypertension.

(3) To measure the compliance to medication among hypertensive patients in study population.

# Method:

This community based cross sectional study was conducted in peri-urban area (Aanchar) of Soura near Sher-i-Kashmir Institute of Medical Sciences during May Measurement Month in 2019. This area is divided into six Mohallas from which two Mohallas were selected randomly. These two Mohallas have total population of 3876. All households from the selected Mohallas were included in this house to house survey. All volunteer participants above the age of 15 years were recruited. A total of 1076 subjects participated voluntarily in the study. The survey team included residents and sociologist from the department of Community Medicine, SKIMS, Soura. During survey, head of each family was contacted and written informed consent was obtained from head of each family as well as from the study participants. Necessary information was gathered with the help of predesigned questionnaire and blood pressure measurement was done by standard method of BP monitoring (in which patient should sit or lie comfortably, the arm should be fully supported on flat surface at heart level and for blood pressure measurement properly sized blood pressure cuff is used). Three readings were taken and a mean of the second and third readings gave accurate blood pressure. Newly detected participants with hypertension were given necessary advice with regard to life style modification and need for treatment on case to case basis. Modified BG Prasad's classification was used for assessing Socioeconomic status.

**Inclusion criteria:** Persons aged 15 years & above, those on anti-hypertensive treatment for more than six months and those who gave informed consent.

**Exclusion criteria:** persons with severe chronic illness, pregnant & lactating women and those who did not give consent for the study were excluded.

**Data Collection:** After obtaining informed consent, subjects were personally interviewed with a predesigned pretested questionnaire. The questionnaire included questions pertaining to socio-demographic characteristics and adherence to treatment.

**Statistical analysis:** The standard statistical chi square ( $X^2$ ) test was applied where ever required. All the results obtained have been discussed on 5% level of significance and p value of < 0.05 has been considered significant. The analysis of the data was done using SPSS version 20.00, Chicago, USA for windows.

# **Results:**

Table 1 depicts 58.4% participants belonged to 15-45 yrs of age group, 71% were females, 64.5% were illiterate, 57.1% were home maker by occupation, 73.8% were married and majority (89.6%) were non-smokers. Socioeconomic status was assessed using the modified BG Prasad's classification. For analysis the Class I & II were grouped together as Upper Socio-economic Class, Class III was considered as Middle Socio-economic Class and Classes IV & V were grouped together as Lower Socio-economic Class. It was observed that majority of the study subjects belonged to the Lower Socio-economic Class (46.3%) followed by Upper Socio-economic Class (27.7%) and Middle Socioeconomic Class (26.0%).

Table 2 shows that 310 (28.8%) of participants had High Blood Pressure out of whom 256 (82.6%) were Known Hypertensive and 54 (17.4%) had Raised Blood Pressure for the first time.

Table 1: Socio-demographic Characteristics of	f
Study Population	

Socio-demographic Characteristics	Frequency (n)	Percent (%)			
Age (Years)					
15-30	294	27.3			
30-45	334	31.1			
45-60	296	27.5			
>60	152	14.1			
	Gender				
Male	312	29.0			
Female	764	71.0			
Educ	ation status				
Literate	382	35.5			
Illiterate	694	64.5			
00	ccupation				
Home Maker	614	57.1			
Retired from Govt. Service	76	7.1			
Labourer	76	7.1			
Govt. Employee	50	4.6			
Skilled Worker	156	14.5			
Student	104	9.7			
Ma	rital status				
Married	794	73.8			
Unmarried	282	26.2			
Socioed	conomic Status	5			
Upper Class	82	7.6			
Upper Middle Class	216	20.1			
Middle Class	280	26.0			
Lower Middle Class	394	36.6			
Lower Class	104	9.7			
Histor	y of Smoking				
Yes	112	10.4			
No	964	89.6			
Total	1076	100.0			

Table 2: Prevalence of High Blood Pressure in Study Population						
	Blood Pressure	Frequency (n)	Percent (%)			
1. Norm	al Blood Pressure	766	71.2			
2. High Blood Pressure		310	28.8			
	a) Known hypertensive	256	82.6			
	b) Raised BP for first time	54	17.4			
	Total	1076	100.0			

# Table 3: Prevalence of High Blood Pressure in Study Participants by Socio-demographic Characteristics (N=1076)

Socio-demographic	Blood pressure		n-value	OP		
Characters	Normal BP n (%)	High BP n (%)	p-value	UK		
Age						
<45 years	434 (73.6)	156 (26.4)	0.058	1.290(0.990-1.681)		
>45 years	332 (68.3)	154 (31.7)				
		Gender				
Male	218 (69.9)	94 (30.1)	0 5 4 1	0.914(0.685-1.219)		
Female	548(71.7)	216 (28.3)	0.541	0.914(0.003-1.219)		
	Л	Marital status	•	•		
Married	512 (64.5)	282 (35.5)	0.000	0 200(0 122 0 202)		
Unmarried	254 (90.1)	28 (9.9)	0.000	0.200(0.132-0.303)		
	His	tory of Smoking		•		
Yes	78 (69.6)	34 (30.4)	0.702	0.020(0.600.1.400)		
No	688 (71.4)	276 (28.6)	0.702	0.920(0.000-1.409)		
		Co-morbidity				
Present	66 (55.9)	52 (44.1)	0.000	0.467(0.316-0.691)		
Absent	700 (73.1)	258 (26.9)	0.000	0.407(0.310-0.091)		
	Fami	ily history of HTN				
Yes	250 (70.6)	104 (29.4)	0.772	0.050(0.725.1.260)		
No	516 (71.5)	206 (28.5)	0.773	0.939(0.723-1.209)		
	•	Education	•	•		
Literate	306 (80.1)	76 (19.9)	0.000	2.049(1.522.2.754)		
Illiterate	460 (66.3)	234 (33.7)	0.000	2.046(1.522-2.754)		
	Socie	oeconomic status		*		
Upper Class	196 (65.8)	102 (34.2)	0.028	0.707(0.518-0.965)		
Middle Class	206 (73.6)	74 (26.4)	0.004			
Lower Class	364 (73.1)	134 (26.9)	0.884	1.024(0./35-1.42/)		
Total	766 (71.2)	310 (28.8)				

Table 3 depicts prevalence of high blood pressure was found more in age group >45 years (37.1%) with participants >45 years having greater odds of high blood pressure as compared to <45years however the difference was not statistically significant (P=0.058, OR=1.290(0.990-1.681). Prevalence of high blood pressure was higher in married individuals (35.5%) as compared to unmarried and the difference was statistically significant (P=0.000, OR=0.200(0.132-0.303). Participants with comorbid conditions had a higher prevalence of blood pressure (44.1%) as compared to those who were without co-morbid conditions and the difference was statistically significant (P=0.000, OR=0.467(0.316-0.691). Illiterates had greater odds of high blood pressure (33.7%) as compared to literates and the difference was statistically significant (P=0.001, OR=2.048(1.522-2.754).

#### Figure: 1 Distribution of Hypertensives by Compliance To Treatment (N=256)



Figure 1 depicts only 88 (34.4%) participants were compliant to treatment and majority 168 (65.6%) showed non-compliance.





As shown in figure 2, 37% reported not using medication due to fear of side effects, 26% stopped using medication when feeling well (when there is no symptoms). 13% stopped medication to avoid drug addiction while as 10% forgot to take medicine, 8% stopped medication as they could not afford to buy the medicines and 6% considered medication ineffective.

Compliance to treatment was more in hypertensives having family history of hypertension and the difference was statistically significant P=0.005, OR=2.141(1.242-3.691). (Table 4)

# **Discussion**:

In our study 58.3% participants belonged to 15-45 yrs of age group, 71% were females since during data collection most of the males were out for work, 64.5% were illiterate, 57.1% were home maker by occupation, 73.8% were married and majority (89.6%) were non-smokers as being females. In our study overall prevalence of high blood pressure was 28.8%, out of whom majority (82.6%) was known hypertensives and only 17.4% had raised blood pressure for the first time. This was in accordance with the study conducted by Zarka et al where it was found that prevalence of hypertension was 34.12%.<sup>[10]</sup> Contrary to our study the overall prevalence of hypertension was 17.1% in a study conducted by Ajeet S B et al.<sup>[11]</sup> The present study also showed that the prevalence of high blood pressure was significantly higher in participants of more than 45 years. This was in accordance with the study conducted in Varanasi by Sing S et al who also found increased prevalence of high blood pressure between 45-54years age group.<sup>[12]</sup> A higher prevalence of high blood pressure was observed in illiterates in our study (33.7%). Wang et al and Jugal Kishore et al also found that both systolic and diastolic blood pressure were inversely associated with the level of education, independent of all other risk factors. Education makes the people aware of the disease and its prevention.<sup>[13,14]</sup> Stefanos Tyrovolas et al in their multinational study on risk factors of hypertension reported that compared to normotensive, hypertensive participants were less educated.<sup>[15]</sup>

# Table 4: Treatment Compliance of Known Hypertensive by Socio-demographic Characteristics (N=256)

Socio-demographic	Compliance to treatment		n valua	0.0			
Characters	Yes N (%)	No N (%)	p-value	UK			
Age							
<45 years	48 (34.8)	90 (65.2)	0.881	1.040(0.619-1.745)			
>45 years	40 (33.9)	78 (66.1)					
		Gender					
Male	22 (31.4)	48 (68.6)	0 5 4 2	0 833(0 463 1 400)			
Female	66 (35.5)	120 (64.5)	0.542	0.033(0.403-1.499)			
		Marital status	•	*			
Married	86 (34.7)	162 (65.3)	0 5 7 0	1 502(0 214 8 060)			
Unmarried	2 (25.0)	6 (75.0)	0.570	1.392(0.314-0.000)			
	His	story of Smoking		•			
Yes	8 (28.6)	20 (71.4)	0.001	0.922(0.245.1.064)			
No	80 (35.1)	148 (64.9)	0.001	0.025(0.545-1.904)			
	-	Co-morbidity	•	*			
Present	20 (41.7)	28 (58.3)	0.220	1 470(0 772 2 796)			
Absent	68 (32.7)	140 (67.3)	0.230	1.470(0.773-2.790)			
	Fam	ily history of HTN	•	*			
Yes	38 (46.3)	44 (53.7)	0.005	2 1 / 1 (1 2 / 2 2 6 0 1 )			
No	50 (28.7)	124 (71.3)	0.005	2.141(1.242-3.091)			
	-	Education	-	*			
Literate	12 (35.3)	22 (64.7)	0.002	1 047(0 402 2 221)			
Illiterate	76 (34.2)	146 (65.8)	0.903	1.047(0.492-2.231)			
	Soci	oeconomic status					
Upper Class	20 (30.3)	46 (69.7)	0.946	0 978(0 513-1 862)			
Middle Class	28 (46.7)	32 (53.3)					
Lower Class	40 (30.8)	90 (69.2)	2.20	1.90(1.049-3.693)			
Total	88 (34.4)	168 (65.6)					

Common risk factors for hypertension, such as comorbid condition like diabetes, family history of hypertension and smoking have been found to be strongly associated with high blood pressure in the current study. Similar observations were made in P R Deshmukh et al study.<sup>[16]</sup> As per the studies of Wang et al and Jugal Kishore et al family history of hypertension was seen to be a predictor of hypertension.<sup>[13,14]</sup> In our study prevalence of high blood pressure was seen more in smokers than in non-smokers however the difference was not statistically significant. Similarly studies by Shanthirani C S et al and Goldstein I B et al also found that tobacco use was associated with hypertension. <sup>[17,18]</sup> However, it was contrary to the study conducted by Jugal Kishore et al.<sup>[14]</sup>

Compliance to any medication is always crucial in control of diseases more specifically for chronic diseases and identifying the factors which determine the compliance can have significant impact on treatment outcomes. Although majority (82.6%) of hypertensives in our study were aware of their disease which is a positive finding however only 34.4% of them were compliant to treatment. This gap in knowledge and practice needs to be addressed by way of understanding the reasons for noncompliance as reported by the study participants. The predominant reasons cited for non-compliance were fear of side effects (37%) and a subjective sense of feeling well and hence not feeling need of taking medicines as perceived by respondents (26%). Besides this 13% of respondents stop taking medicines for fear of getting addicted to it. This was in accordance with the study conducted by Angelina Alphonce Joho.<sup>[19]</sup> However, it was contrary to the study conducted by Hashim et al in Pakistan.<sup>[20]</sup> Studies done in Tamil Nadu by Venkatachalam J et al and Andhra Pradesh by Hema K. and Padmalatha P reported a compliance of 24.1% and 15.3% respectively.<sup>[21,22]</sup> Similar studies done in Ethiopia by Ambaw et al and Malaysia by Khalil A et al observed a high rate of compliance to therapy at 64.6% and 48.7% respectively.<sup>[23,24]</sup> Our study showed that certain socio-demographic characteristics like age,

gender, marital-status and co-morbidity had no significant association with the compliance. Similar findings were observed in a community-based study by Venkatachalam J et al in Tamil Nadu.<sup>[21]</sup> Present study revealed that certain demographic characteristics like smoking, family history of hypertension, literacy and SES had significant association with compliance to therapy (P<0.05). This was in accordance with the study conducted by Hema K. and Padmalatha P in Andhra Pradesh where demographic characteristics like age, sex, type of family, literacy status had significant association with compliance to therapy (P<0.05).<sup>[22]</sup> Similar study done by Aarti M Nagarkar et al (2013) in a tertiary care hospital in Pune, found that medication compliance was significantly associated with age, family type and experience of symptoms.<sup>[25]</sup>

#### **Conclusion**:

The prevalence of high blood pressure was high and compliance to medication was low in the study population. Some of the demographic characteristics had significant influence on compliance.

**Limitation :** Many predictors of hypertension like daily salt intake, lipid profile, stress were not assessed.

**Recommendations :** Imparting health education and counseling at the time of visit to health institutions by the patient and during home visits by health workers can improve the compliance level which is vital for control of hypertension. Strategies included may involve patient education, enhanced communication with the patient focused towards behavioral change. Awareness generation regarding the perceived susceptibility and severity of the disease, besides the benefits of the life style modification and timely treatment will help a long way in adopting a healthy life style and compliance to treatment.

#### **Declaration:**

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# Overweight and Obesity among Primary School Going Children in Urban Agra: A Cross-Sectional Study

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#### Abstract:

**Introduction:** Childhood obesity is global nutritional concern. It is precursor of various noncommunicable diseases and metabolic disorders in adulthood. **Objective:** To determine the prevalence of overweight and obesity among primary school students in urban Agra. **Method:** This cross-sectional study was done among 200 children studying in grades 1st to 5th in government and private school of Agra. List of all schools in Agra city having 1<sup>st</sup> to 5<sup>th</sup> classes was obtained from official website of Agra District Authorities. One government and one private school were selected. 100 students were selected from each selected school. A pre-designed and pre-tested administered questionnaire was used to collect information and anthropometric measurement; height and weight of the student measured to calculate Basal Metabolic Index (BMI). Overweight/obesity was defined using age and sex specific body mass index cut off points. **Result:** Prevalence of overweight and obesity was 16.5% and 7% respectively. Prevalence of overweight and obesity was more in boys as compared to girls. Obesity is seen only in private school students. **Conclusion:** In the present study, the magnitude of overweight and obesity is high among boys and children studying in private school. Health education should be given in the schools so as to educate children as well as parents regarding risk factors, preventive measures and the consequences of overweight and obesity.

Key words: Body mass index, Obesity, Overweight, Sampling

#### Introduction:

For persons with coronavirus disease 2019 (COVID-19), the published studies have shown link between obesity and risks of hospitalization.<sup>[1]</sup> Covid pandemic has occurred when majority of countries have prevalence of overweight/obesity greater than 20%.<sup>[2]</sup> Obesity is a major public health issue worldwide. Likewise, childhood obesity is a global nutritional concern. Childhood obesity leads to serious chronic diseases and psychosocial complications; which lead to stigmatization, poor socialization and greatly increase the risk of

morbidity and mortality in adults.<sup>[3-6]</sup> The prevalence of overweight and obesity among children has increased considerably during the past decades all over the world. Overweight and obesity, which were previously considered problems afflicting mainly the affluent, are now markedly on the increase in low and middle-income developing countries.<sup>[7,8]</sup> According to the World Health Organization (WHO), for children aged 5–19 years, overweight is defined as a Body Mass Index (BMI)-for-age greater than one standard deviation, and obese children as a BMI-for-age greater than two standard deviations above the WHO

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growth reference median.<sup>[9]</sup> Globally, the prevalence of overweight among children aged 5–17 years is 10%; though, this prevalence varies according to region. With globalization and urbanization, the exposure to the obesogenic environment is increasing in both high-income countries and Low and Middle-Income Countries (LMICs).

In Asia, the prevalence of obesity in 2010 was 4.9% (about18 million children). If current trends continue, over 70 million infants and young children will be overweight or obese by 2025, and India will have over 17 million obese children.<sup>[10]</sup> In recent systematic review (2018) it was found that the overall prevalence of obesity was 5.8% in Asian children.<sup>[11]</sup> The combined prevalence of childhood overweight and obesity in India according to Ranjani H et al (2016) in their systematic review study was 19.3 per cent. <sup>[12]</sup> Most of the behavioral risk factors for non-communicable diseases (NCDs) start during childhood and often lead to intermediate risk factors such as obesity, hypertension and dyslipidemia early in life, even in childhood and adolescence. Consequently, childhood is the critical time to detect overweight/obesity and intervene for preventive measures for non-communicable diseases. Limited research is done on non communicable diseases and risk factors in Uttar Pradesh. Our study on childhood obesity will give insight in overweight and obesity and some risk factors. With this background, we conducted a study to determine differences in the prevalence of childhood obesity based on types of schools and gender among primary grade children in urban Agra.

#### Method:

The present study was designed as crosssectional and conducted between duration October 2019 to December 2019. Ethical clearance for the study was taken from Institutional Ethical Clearance Committee, Sarojini Naidu Medical College, Agra. We had taken consent from parents of 200 children studying in grades 1st to 5th in government and private schools of Urban Agra. List of all schools in Agra city having 1st to 5th classes was obtained from official website of Agra District Authorities. One government and one private school were selected. 100 students were selected from each selected school. 1st to 5th class were taken from each school, a single class randomly was chosen wherever sections were present. 20 students from each primary class  $(1^{st} to 5^{th})$  were selected using systematic random sampling as every  $2^{nd}$  student was picked up on the basis on their registered roll numbers.

Prior permission by school principal of both private and government school was taken to conduct this study. A pre-designed and pre-tested questionnaire was used to collect information. A weighing (bathroom) scale and stadiometer were used to measure the weight (nearest 0.5 Kg) and height (nearest 0.1 cm) of each child using standard procedure. BMI was calculated as weight  $(Kg)/height^{2} (m^{2})$ . Sex and age specific percentile cutoff points of a reference population (85<sup>th</sup> percentile for overweight and 95<sup>th</sup> percentile for obesity) were used. The date of birth of each child was taken from the school records. Children were categorised into three groups : obese (>95<sup>th</sup> percentile), overweight  $(\geq 85^{\text{th}} \text{ percentile})$  and normal  $(< 85^{\text{th}} \text{ percentile}, >5^{\text{th}})$ percentile) using age and sex specific percentiles of BMI.<sup>[13]</sup> Data was analyzed using MS excel and interpreted accordingly.

#### **Results:**

Total of 200 students were studied in present study, of which 57.5% were boys and 42.5% were girls. Mean age of primary school going boys and girls was 9.4 years ( $\pm$ 1.72) and 9.5 years ( $\pm$ 1.81) respectively . Mean weight and height among boys (32 kg, 1.35 m) was higher than that of girls (30.8 kg,1.33m). The body mass index (BMI) reported to be higher in boys (17.03 Kg/m<sup>2</sup>) as compared to girls (16.9 Kg/m<sup>2</sup>). (Table-1)

Most of the obese children (40%) were found to be in the age group of nine years followed by age group of ten years (32.5%). The prevalence of overweight and obese status found to be 17.5% and 10% among boys and 15.5% and 4% among girls respectively. The prevalence of overweight and obesity found to be 30% and 14% among private school while only 3% were overweight and none was found to be obese in government school.(Figure -1,2).

The overall prevalence of overweight and obese children was found to be 16.5% and 7% respectively. (Table -2)

# Discussion:

Childhood obesity is growing at alarmingly rate and labeled recently as "exploding nightmare" by World Health Organization (WHO).<sup>[14]</sup> With a rapid demographic and socioeconomic transition, India is becoming the epicenter of epidemics of both childhood and child obesity, especially in urban populations. Over the years, epidemiological studies have reported a consistent increase in the prevalence of childhood overweight and obesity in the subcontinent.<sup>[14]</sup> The prevalence of overweight and obesity among children and adolescents aged 5–19 has risen dramatically from just 4% in 1975 to just over 18% in 2016.<sup>[15]</sup>

There has been a phenomenal rise in proportions of children having obesity in the last 4 decades

especially in the developed world.<sup>[14]</sup> Studies emerging from different parts of India within last decade are also indicative of similar trend."[15,16] In present study in Urban Agra the prevalence of overweight and obese status found to be 17.5% and 10% among boys and 15.5% and 4% among girls respectively. Results are similar to previous studies from India<sup>[17-20]</sup> but it was not in concordance with some other studies<sup>[21-23]</sup> while study from Chennai, West Bengal and Telangana found more prevalence in girls.<sup>[24-27]</sup> Socio-economic trends in childhood obesity in India are also emerging. The prevalence of overweight and obesity found to be 30% and 14% among private school while only 3% were overweight and none was found to be obese in government school. A study from northern India reported a childhood obesity prevalence of 5.59% in the higher socio-economic strata when compared to 0.42% in the lower socio-economic strata. But now it is spreading in lower socio-economic groups as well. Similar findings from other studies from country were found.<sup>[21-23,28-30]</sup>

Variable	BOYS(N=115)		GIRLS(N=85)		TOTAL(N=200)	
variable	MEAN	SD	MEAN	SD	MEAN	SD
Age(years)	9.4	1.72	9.6	1.93	9.5	1.81
Weight(Kg)	32	9.88	30.8	9.21	31.48	9.60
Height(metre)	1.35	0.12	1.33	0.13	1.34	127
BMI(Kg/m2)	17.03	2.96	16.82	2.35	16.9	2.71

Table 1: Anthropometric measurements o	of study participants (N=200)
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Determinant	Overweight (n=33)	Obesity (n=14)	P value			
Gender wise						
Boys	20 (17.5%)	0.22				
Girls	13 (15.5%)	0.23				
School wise						
Private	30 (30%)	14 (14%)	0.24			
Government	3 (3%)	0 (0%)				

Author	Year	Region	Age group	Sample size (n)	Criteria used	Overweight Prevalence (%)	Obesity prevalence (%)
Gupta & Ahmad <sup>[32]</sup>	1990	New Delhi	5-15	3861	Ponderal Index (Kg/m3)	-	Boys= 8 Girls=7
Chatterjee <sup>[33]</sup>	2002	New Delhi	4-18	5000	IOTF-Cole et al	Overall =29	Overall =6
Marwaha et al <sup>[34]</sup>	2006	New Delhi	5-18	21485	IOTF-Cole et al	Boys= 16.8 Girls=19	Boys=5.6 Girls=5.0
Sharma et al <sup>[35]</sup>	2007	New Delhi	4-17	4000	IOTF-Cole et al	Overall =22	Overall =6
Raj et al <sup>[36]</sup>	2007	Kerala	5-16	20263	CDC Growth Charts*	Overall =6.6 (Boys= 7.3 Girls= 5.9)	Overall=1.3 (Boys= 1.7 Girls=0.9)
Kaur et al <sup>[37]</sup>	2008	New Delhi	5-18	16955	IOTF-Cole et al	Overall 2.7[Lower Income(LI)] 6.5[Middle Income(MI)] 15.3[High Income(HI)	Overall 0.1(LI) 0.6(MI) 6.8(HI)
Premanath et al <sup>[38]</sup>	2010	Mysore	5-16	43152	Agarwal Charts	Overall =8.5 (Boys= 8.8 Girls= 8.2)	Overall =3.4 (Boys= 3.7, Girls=3.0)
Khadilkar et al <sup>[31]</sup>	2011	Delhi & Chandigarh Kolkata, Chennai, Bangalore, Hyderabad, Mumbai, Pune, Baroda, Raipur	2-17	20243	IOTF-Cole et al WHO	Overall=14.9 (Boys= 15.2 , Girls= 8.2) Overall=11.1 (Boys= 10.8 , Girls= 11.4)	Overall=4.7 (Boys= 5.4, Girls= 3.9) Overall=15.9 (Boys= 18.4, Girls= 12.8)
Misra et al <sup>[39]</sup>	2011	Delhi, Jaipur, Agra Allahabad, Mumbai	8-18	38296	IOTF-Cole et al** CDC WHO#	14.4 14.5 18.5	2.8 4.8 5.3
Patnaik et al <sup>[40]</sup>	2011	Bhuba- neswar	5-15	468	CDC	Overall = 14.1	Overall = 14.5
Ghosh <sup>[41]</sup>	2011	Kolkatta	8-12	753	IOTF-Cole et al	Overall = 9.4	Overall =6.1
Chakraborty et al <sup>[42]</sup>	2011	Kolkatta	5-8	271	CDC	Overall = 14.4	Overall =5.2
Preetam M <sup>[43]</sup>	2011	Puducherry	6-12	2980	CDC BMI Charts	4.41	2.12

# Table 3: Comparison of previous studies on obesity and overweight prevalence in the Children age group

Healthline Journal Volume 12 Issue 1 (January-March 2021)

Siddiqui & Bose <sup>[44]</sup>	2012	Indore	7-14	2158	IOTF-Cole et al	-	Overall=15.0 (Boys= 6.8, Girls= 8.2)
Singh & Devi <sup>[45]</sup>	2013	Manipur	6-12	192	IOTF-Cole et al	-	Boys = 1.6 Girls = 5.2
Longkumar <sup>[46]</sup>	2013	Nagaland	8-15	571	IOTF-Cole et al	Overall =2.3 (Boys= 2.1, Girls = 2.5)	-
Sonya et al <sup>[28]</sup>	2014	Chennai	6-11	8025	IOTF-Cole et al	Private (Boys=16.2, Girls=13.7) Government (Boys=1.6, Girls= 2.6)	Private (Boys=4.2, Girls=3.9) Government Boys=0.3, Girls= 0.4)
Ranjani H et al <sup>[12]</sup>	2016	16 states	1-12 & 10-17	52 studies	Systematic review	Overall overwight and obesity: 19.8	-
Pathak S et al <sup>[47]</sup>	2018	Vadodara	10-18	188	IAP Charts	Urban= 32.3 Rural= 6.7	Urban= 31.3 Rural= 2.2
Kumar R <sup>[48]</sup>	2018	North- East	6-10	793	BMI-for-age chart of WHO	Overall = 10.5 (Boys= 10.97, Girls=9.76)	Overall =2.4 (Boys=3.21, Girls=1.21)
Chandra et al <sup>[49]</sup>	2019	Hyderabad	9-15	544	IAP 2016	Overall = 35.8 (Boys=28.1, Girls=44.5)	Overall = 24.6 (Boys=17.3 &Girls =32.8
Aqeel KI et al (Present study)	2020	Agra	5-13	200	CDC BMI Charts	Overall = 16.5 (Boys=17.5, Girls=15.5)	Overall = 7 (Boys=10, Girls=4)

\*Centers for Disease Control and Prevention \*\*International Obesity Task Force #World Health Organisation

The overall prevalence of overweight and obese children was found to be 16.5% and 7% respectively. Comparison of prevalence of overweight and obese from various parts of country is highlighted in Table -3. It shows that prevalence of overweight and obesity is comparatively lower in northeast states, Puduchery than other states. Many definitions used in various studies depend on cutoffs of IOTF-Cole et al, WHO and CDC.<sup>[12]</sup> India specific cut-points were Agarwal charts and Indian Academy of Pediatrics (IAP).<sup>[12]</sup> Many studies show evidence that overweight and obesity is more in higher socioeconomic strata.<sup>[28]</sup> But as now non communicable are now penetrating in rural areas, strategies have to rolled out to prevent and control childhood obesity. Comparison of prevalence of overweight and obese from various parts of country is highlighted in Table-3. Study has limitations of covering two schools only, small sample size and including only few risk factors.

#### **Conclusion:**

In the present study, the magnitude of overweight and obesity is high among boys and children studying in private school. It is recommended that more health education campaigns, physical education, healthy eating habits, and behavior activities of children are to be taught at the school level, especially in private schools.

#### **Recommendations:**

Health education should be given in the schools so as to educate children as well as parents regarding risk factors, preventive measures and the consequences of overweight and obesity. As childhood obesity is largely preventable, prevention strategies at individual and population level should be incorporated to tackle non-communicable disease burden in country. The Government of India's National Program on Prevention and Control of Diabetes, Cardiovascular Disease, and Stroke has a school component, which needs to be strengthened

#### **Declaration:**

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# Knowledge and Perception about Risk Factors and Symptoms of Cervical Cancer in Female Teachers of Government and Private Schools of Chandigarh

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#### Abstract:

**Introduction:** Cervical cancer ranks as the 2<sup>nd</sup> most frequent cancer among women in India after Breast Cancer. School Teachers constitute important stakeholder position in the society. The knowledge about cancer cervix is beneficial for them and also to the children they teach. **Objective:** To assess and compare the knowledge about Cervical Cancer, its risk factors, symptoms and signs prevailing in Female School Teachers of Government & Private Schools in the area of Chandigarh. Method: A Cross-sectional study using multistage random sampling was conducted among Female School Teachers. City was divided in to 4 quadrants, 1 private and 1 Government school was randomly selected from each quadrant. From each quadrant 50 participants were taken in the study. Interview of 202 teachers were conducted through predesigned and pretested questionnaire during February to April 2018. **Results:** Unawareness about risk factors for cervical cancer was found in 79% of respondents. On asking about risk factors for Cervical Cancer, 8% of participants mentioned that infertility, heredity, use of sanitary pads and depression leads to cervical cancer which shows myths prevailing in community. Awareness about signs and symptoms of Cervical Cancer was found only in 37% respondents. Only 23.8% of Government School Teachers and 37.6% of Private School Teachers were aware about association of HPVwith Cervical Cancer. **Conclusion:** Low Levels of Awareness about Cervical Cancer was found in the study even in highly educated group of School Teachers belonging to Chandigarh.

Keywords: Awareness, Cervix Cancer, Risk Factors, School Teachers

# Introduction:

Cervical cancer ranks as the  $2^{nd}$  most frequent cancer among women in India after Breast Cancer and is also the  $2^{nd}$  most frequent cancer among women between 15 and 44 years of age after Breast Cancer.<sup>[1]</sup> ICMR report in 2016 showed that Cancer of the cervix is the third most common cancer with estimated 1 lakh new cases in 2016 in India and about Epidemiologic studies have shown that the Human Papilloma Virus (HPV) DNA was detected in 93% of the tumors of cervical cancer.<sup>[3]</sup> HPV is a necessary cause of cervical cancer, but it is not a sufficient cause. Other cofactors are necessary for progression from cervical HPV infection to cancer. As

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per previous studies, tobacco smoking, high parity, long-term hormonal contraceptive use, and coinfection with HIV have been identified as established cofactors. Co-infection with Chlamydia trachomatis and herpes simplex virus type-2, immunosuppression, and certain dietary deficiencies are other probable cofactors.<sup>[4]</sup> There are many clinical characteristics that predispose a woman to cervical cancer: being sexually active in early age ,multiple sexual partners, delivery of the first baby before the age of 20 years, multiparty with poor birth spacing between pregnancies, poor socioeconomic status and poor personal hygiene. Carcinoma of the cervix shares similar epidemiological features to those of sexually transmitted diseases and viral infections and these are strongly linked to cancer cervix as causative agents. The awareness about risk factors can cause decrease in incidence of cervical cancer.

Women with Sexually Transmitted Disease (STD), HIV infection, herpes simplex virus 2 infection, HPV infection (16, 18, 31, 33) and condylomata have a high predisposition to cancer. Women who do not go for regular health check-ups and Pap tests, take combined Oral Contraceptive and Progestogens pills over 8-year periods are prone for adenocarcinoma of the endocervix (double the risk). Five per cent women exposed to diethylstilboestrol in utero developed carcinoma of vagina and cervix.<sup>[5]</sup> Girls and women should be made aware about these facts which can contribute to lessen the burden of disease.

In 2013, according to PBCR Chandigarh Age Adjusted Incidence Rate of Cervix Uteri Cancer was 8.8.<sup>[6]</sup> Seeing the high number of deaths and incidence of cervical cancer in Indian population it is necessary to make population aware about causes and symptoms of cancer of cervix.

As School Teachers are main stakeholders and influencer of the society, their knowledge will create awareness about cervical cancer among adolescent girls. Present study was conducted to assess and compare the knowledge about Cervical Cancer among female School Teachers of Government & Private Schools in the area of Chandigarh.

# Method:

A Cross-sectional study was conducted in randomly selected private and government schools of Chandigarh. The Study population included the Female School Teachers of selected Government and Private schools. There were 107 Government and 78 recognized private middle, secondary and senior secondary schools in Chandigarh. City was divided into four quadrants according to the directions according to map of the city. From each quadrant, a Government School and a Private School were selected randomly. From each quadrant, 25 Female **Government Schools Teachers and 25 Female Private** School teachers were selected. Equal representation was taken from Government Schools (101) and Private Schools of Chandigarh (101). consent was taken from teachers prior to data collection. Prior permission from the respective officials was taken to conduct the study. Study Period was four Months (January to April 2018). A Pre-designed and pre tested questionnaire was used to collect information for the study. Questionnaire was filled by the respondents themselves, without any assistance. Information was collected about socio-demographic information of study participants and knowledge was assessed about risk factors, symptoms and association of HPV with cervical cancer. The obtained data was entered into Microsoft Excel 2010. Descriptive Analysis was done in form of numbers, percentages, and represented in form of tables and figures. The data collected was analysed with help of MS Excel 2010.

# **Results**:

Table 1 shows the age of respondents ranged from 25 to 60 years in Government Schools with mean of 42.29±9.089 years and in Private Schools mean age was a 36.50±8.112 yearwith range of 22-56 years. 83.2%of Government School teachers and 84.2% of Private schools were Postgraduate. 95% offemale teachers of Government Schools and 73.3% of Private Schools female teachers were married. Majority of respondents were having monthly income of Rs 30,000 to Rs 60,000 (46.5% in Government and

Variables	Government(N=101)	Private(N=101)
Mean Age	42.29±9.089	36.50±8.112
Education	No.(Percent)	No.(Percent)
Postgraduate	84(83.2%)	85(84.2%)
Graduate	13(12.9%)	14(13.8%)
Doctorate	4(4.0%)	2(2.0%)
Marital Status		
Married	96(95.0%)	74(73.3%)
Unmarried	5(5.0%)	24(23.8%)
Others like widow/ divorcee	0(0%)	3(3.0%)
Monthly Family Income (Rs.)		
<30000	8(7.9%)	16(15.8%)
30000-60000	47(46.5%)	47(46.5%)
>60000	46(45.5%)	38(37.6%)
Family Type		
Nuclear	58(57.4%)	52(51.5%)
Joint	43(42.6%)	49(48.5%)

Table 1: Socio demographic distribution of the respondents
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# Table 2: Distribution of respondents according to their Knowledge about part of body affected in Cervical Cancer

Body Part / Organ Involved	Government School Teachers (N=101)	Private School Teachers(N=101)
	n (%)	n (%)
Cervix	23(22.8%)	31(30.7%)
Uterus	35(34.7%)	27(26.7%)
Female cancer	7(6.9%)	2(2.0%)
Lower abdomen	4(4.0%)	0(0.0%)
Neck	3(3.0%)	6(5.9%)
Vagina	7(6.9%)	16(15.8%)
Don't know	22(21.8%)	19(18.8%)
Total	101	101

Risk Factors (Multiple Responses to open ended Question)	Government (N=101)	Private (N=101)
Infection	11	6
Poor hygiene	7	1
Smoking	5	1
Unsafe Sex	4	7
Oral contraceptives	3	1
Multiple Pregnancy	2	3
Don't know	79	79
Myths like Infertility, Use of sanitary pads are risk factors	8	8

#### Table 3: Distribution of respondents according their Knowledge about Risk Factors of Cervical Cancer

# Table 4: Distribution of respondents according to their knowledge about Signs and Symptoms of Cervical Cancer

Signs and Symptoms*	Government School Teachers (N=101)	Private School Teachers (N=101)
Heavy Bleeding During Periods	18	14
Discharge From Vagina	11	13
Lower Abdominal Pain	13	11
Pain In Legs	1	8
Back Pain	1	7
Bleeding Between Periods	0	7
Irregular Menses	8	6
Pain And Bleeding During Intercourse	7	6
Bleeding After Menopause	3	3
Weight Loss	5	2
Don't Know	63	63

\*Multiple responses were allowed

46.5% in Private) and are having nuclear type of family (57.4% in Government and 51.5% in Private).Majority of respondents were aware that Cervical Cancer is a Non Communicable Disease (91.1% in Government and 88.1% in Private) and cannot spread from contact with patient.

Government schools were aware that Cervical Cancer involves cervix part of uterus and in Private school teachers this awareness was slightly more as 30.7% gave this answer.34.7% of Government Teachers and 25.7% of Private Teachers were aware that it involves uterus but not sure about which part of uterus it involves.6.9% of Government Teachers and 2% of Private Teachers thought it as female

Table 2 shows that only 22.8% teachers of

reproductive organs but unaware of exact part involved.3% of Government teachers and 5.9% of Private teachers confused it with cervical part of spine (neck). 21.8% of Government Teachers and 18.8% Private Teachers responded that they are unaware about it.

Around 79 respondents were totally unaware about the risk factors for cervical cancer Other respondents' knowledge was also poor as most of them gave either one or two correct responses. Some Myths like Infertility, Heredity, Use of sanitary pads and depression as Risk factors also recorded in data.(Table 3)

As shown in Table 4, total 63 respondents were totally unaware about signs and symptoms of Cervical Cancer in both Government and Private Schools. As question was open ended in nature usually one or two correct responses were recorded by respondents which shows a very poor knowledge of signs and symptoms in study community.

Only 23.8% of Government School Teachers and 37.6% of Private School Teachers were aware that Infection of HPV increases risk of Cervical Cancer. Majority of respondents mentioned their source of information is mass or social media (37.6% in Government and 43.6% in Private) which shows popularity of mass and social media, others were family or friends and print media. Majority of teachers (92%) think creating awareness about cervical cancer in adolescent girls will be useful. Around 86% School Teachers were in favor of adding this knowledge in school curriculum.

# Discussion:

In present study it was found that, 22.8% teachers of Government schools were aware about Cervical Cancer and in Private school teachers this awareness level was slightly more (30.7%).

Mihaela et al (2017) <sup>[7]</sup> has done study in Romanian women which shows very high awareness 95%. Toye (2017)<sup>[8]</sup> et al did study among female public secondary school teachers in Mushin local government area of Lagos State, Nigeria. They reported very high (100%) awareness. Similarly Touch et al (2016)<sup>[9]</sup> conducted study among Cambodian women in Kampong Speu Province reported awareness of 74%. All foreign studies showed high awareness levels than present study, it may be due to more strong public awareness programs in these countries.

In present study, 79% respondents were unaware about risk factors and 63% respondents were unaware about signs and symptoms of cervical cancer whereas in Salem M et al (2017)<sup>[10]</sup> study conducted in Saudi female secondary school teachers in Al Hassa, Saudi Arabia shows 65.4% and 63.4% were less-knowledgeable about Cervical Cancer risk factors and early signs and symptoms, respectively. Present study showed low level of awareness than Salem M et al (2017)<sup>[10]</sup> study, reason may be that present study involves middle, high and secondary school teachers whereas study involved only female secondary school teachers.

In the study, 79% respondents are unaware about risk factors and 63% are unaware about signs and symptoms whereas Jain S M et al (2016)<sup>[11]</sup> study in a Tertiary Care Institute in Central India (MGIMS Sewagram Maharashtra) reported 42.3% respondents were not aware of any risk factor and 27.6% were not aware of any symptom of cancer cervix. Jain S M et al (2016)<sup>[11]</sup> study reports high awareness levels because it involved nurses who are from paramedical background where as our respondents were teachers and from non-medical background which shows educational background also plays major role in awareness.

In present study majority of respondents said their source of information is mass or social media (37.6% in Government and 43.6% in Private) and family & friends (30.7% in Government and 38.6% in Private) whereas Narayana G et al (2017)<sup>[13]</sup> study reported that most of (74.6%) the respondents had heard about cervical cancer and majority of them are heard from media (41.6%) and friends (20.5%). In our study information from friends was reported higher which shows people discuss health issues with near and dear ones which may be due to good educational status of respondents.

#### **Conclusion and Recommendations:**

Study shows that awareness of Cervical Cancer'srisk factors, signs and symptoms is low in even educated class like school teachers of a modern progressive city like Chandigarh. Awareness can help in reducing risk and early detection of Cervical Cancer is an established fact. School Teachers are important stake holders of society and influencer on their students so it is recommended that special trainings and awareness activities for cancer including cervical cancer should be conducted for influential stake holders like school teachers.

#### Limitations:

The major limitations of study were: collected data was based on self- reporting due to constraint of time,due to lack of time interview method cannot be applied which may be a better approach and as study was conducted in specialized group so findings cannot be generalized for entire population.

#### **Declaration:**

Funding: Nil

Conflict of Interest: Nil

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# **Evaluation of Depression among Medical Students of Gujarat during COVID-19 Pandemic** Saumya Joshi<sup>1</sup>, Heer Patel<sup>1</sup>, Nirmika Patel<sup>2</sup>

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### Abstract:

**Introduction:** The Covid-19 pandemic is a public health emergency with both physical and mental health risks. During this pandemic general medical complications have received the most attention, whereas only few studies address the potential direct effect on mental health of SARS-CoV-2 and the neurotropic potential. **Objectives:** To evaluate the depression score of an individual based on PHQ-9 scoring scale and to further classify the severity of depression among medical students. **Method:** It was a cross-sectional observational study, where primary quantitative data was collected using the PHQ-9 scale to assess the level of depression among the medical students of Gujarat through Google forms. **Results:** Most of the participants were from 1st year MBBS (>50%) and 2nd year MBBS (37%) and rest were from 3rd year. Around 29.4% students suffered from minimal depression, 34% has mild depression, 19% had moderate depression, 12% had moderately severe depression and 5.6% students suffered from severe depression. **Conclusion:** COVOD-19 pandemic is having impact on mental health of the medical students. Early evaluation of depression may help to decide intervention to reduce further depression among the students.

**Key words:** COVID-19, Depression, Medical students, PHQ-9

#### Introduction:

Covid-19, commonly known as the novel Coronavirus is believed to have originated from a wet market in Wuhan, China, and has spread all over the world, resulting in a large number of hospitalizations and deaths.<sup>[1]</sup> As of 29<sup>th</sup> March,2021 there were approximately 126.8 million cases worldwide and 12 million confirmed cases in India.<sup>[2]</sup> For Indians, challenges in the medical sector, further deepens the worries that heighten psychological distress. Amidst the pandemic, people fear of getting infected with the virus/disease resulting in anxiety, stress, and depression, etc. Students are also facing other issues like not able to attend physical classes and delayed exams. Furthermore, the indirect effects of the pandemic on general mental health are of increasing concern, particularly since the SARS-CoV-1 epidemic (2002–2003) which was also associated with psychiatric complications.<sup>[3]</sup> Even the cases of depression and anxiety increased after the epidemic in China. At this moment of time it is very important to access the depression levels of Medical Students because they have to compromise their studies as well as have to report for COVID duty at various health facilities. Present study was conducted with objectives of evaluating the depression score of an individual based on PHQ-9 scoring scale among medical students and also to classify the severity of depression among them according to PHQ-9.

# Method:

A cross-sectional observational study was conducted among medical students of different

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medical colleges of Gujarat. MBBS students of different medical colleges were invited to participate in study through Google form link on social media. Those who agreed to participate in study had filled the PHQ-9 Questionnaire enlisted in the Google Form. Total 668 students participated in study from different medical colleges of Gujarat. Around 36 students failed to fill the name of belonging medical college. Total 632 students have filled up complete forms.

The PHQ-9 is based on the diagnostic criteria for depression from the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV).<sup>[4]</sup> The response options were: 0 = "not at all", 1 = "several days", 2 = "more than half the days" and 3 = "nearly every day". A two-week recall period was used. The total score ranged from zero to 27, with a higher score indicating greater self-reported depression.

The collected data was then imported into Microsoft excel and analyzed by using Epi Info 7 software.

Total Score	Depression Severity
1-4	Minimal depression
5-9	Mild depression
10-14	Moderate depression
15-19	Moderately severe depression
20-27	Severe depression

Interpretation of Total Score:

#### **Results:**

There were total 668 students participated in study from different medical colleges of Gujarat. 36 students failed to fill the name of belonging medical college so in this study final participants were 632. Students from almost all medical colleges of Gujarat like government medical colleges, GMERS medical colleges and private medical colleges have participated in the study. Around 51%(327) were participated from GMERS medical colleges followed by 10%(67) participants from Smt NHL medical college and rest 39% from all others medical colleges.



# Figure 2: Distribution of study participants according to study year(N=632)



Table 1: Grading of depression among study participants based on PHQ-9 scores (N=632)

Type of Depression	n (%)
Minimal Depression (1-4)	186(29.4%)
Mild Depression (5-9)	215(34%)
Moderate depression (10-14)	119(19%)
Moderately severe depression (15-19)	76(12%)
Severe depression (20-27)	36(5.6%)

Figure 1 shows that out of total 632 students, 58.2% were male students and 41.8% were female students.

Figure 2 shows distribution of study participants according to their study year, more than half (56%) of students were from  $1^{st}$  year of M.B.B.S. followed by 37% from  $2^{nd}$  year.

Doprossion	Study Year			
Depression	1st Year	2nd Year	3rd First	3rd Final
Minimal Depression (1-4)	88 (13.9%)	72(11.4%)	18(2.8%)	8(1.3%)
Mild Depression (5-9)	116(18.4%)	83(13.1%)	16(2.5%)	0(0.0%)
Moderate Depression (10-14)	77(12.2%)	38(6.0%)	1(0.2%)	3(0.5%)
Moderately Severe Depression (15-19)	43(6.8%)	32(5.1%)	1(0.2%)	0(0.0%)
Severe Depression (20-27)	30(4.7%)	6(0.9%)	0(0.0%)	0(0.0%)

Table 2: Association between study year and PHQ-9 score of depression (N=632)

Table 1 showed the grades of depression among study participants which were decided according to Patient Health Questionnaire (PHQ-9) scores. Around 29.4% students suffered from minimal depression, 34% has mild depression, 19% had moderate depression, 12% had moderately severe depression and 5.6% students suffered from severe depression

It was observed that Moderate depression was present among 8% females and 10.75% males, Moderately severe depression was noticed in 5.5% females and 6.5% of males while severe depression was remarkably low in both females (2.2%) and males (3.5%).There is no statistical significant difference between gender of participants and presence of depression.

Table 2 showed the association between year of study and grading of depression. Statistical significant difference was noticed between study year of participants and presence of depression.

# Discussion:

In present study, there were 632 participants from different medical colleges of Gujarat. Among total participants, more than half of students were from 1st year of M.B.B.S. followed by 37% from 2nd year and rest were from 3rd first and 3rd final year. Vala NH et al,<sup>[5]</sup> study conducted among 250 1st-year MBBS students. In present study, out of total 632 students, 58.2% were male students and 41.8% were female students.

There are list of studies on depression evaluation among medical students. According to different

studies, there are various reasons for depression in medical students like examination fear, fear of failure, vast syllabus.<sup>[5,6]</sup> Furthermore, socioeconomic impact of this current COVID-19 pandemic can be important stress factor among the students. During SARS and H1N1 pandemic few studies were conducted in china which shows obvious anxiety and stress among university students.<sup>[7]</sup>

Based on Patient Health Questionnaire (PHQ-9) scores, around two thirds students were suffered from minimal or mild depression, only one third students were suffered from moderate or moderately severe depression and only a few students were suffered from severe depression. Current study showed that higher degree of depression was found in male compare to female. The percentage of male involvement was 58.2%. The cause of higher degree of depression in males be due to various factors like Genetic Factors - (With a history of Familial Depression), Reluctance to discuss depression symptoms Environmental Stresses (Financial condition, loss of loved ones etc), downplaying signs and symptoms ,Stress due to Social Isolation - It has affected the mental health at a great level in this ongoing COVID-19 pandemic, Social Stigma regarding male mental depression in Indian society etc. Vala NH et al <sup>[5]</sup> showed in their study gender based difference in depression [male (6.4%) and females (9.2%)]. Another study Halperin et al[8], shows that Higher PHQ-9 scores were seen for participants who were female and in their preclinical phase of education and also shows statistically significant difference in gender, class year seen in the study.

The present study showed statistical significant difference among study year of participants and presence of depression. The students of 1st year went through more depression, primary reason being more participation from first year and secondary reason is that the 1st year university exam is scheduled early as compared to other years. Insufficiency of practical knowledge and hands on skills were deprived and are now to be tested in the examinations has led to a mental derangement. Second and third year students face difficulties like lack of exposure to test taking skills, practical skills, clinical skills in ward like history taking etc.. Moreover students from second year onwards have faced challenges regarding the COVID ward duty like not being provided enough sanitation, PPE kit being intolerable in the heat, risk of being COVID positive and no hotel isolation being provided and having to compensate the mental health of medical students in India. High anxiety during the pandemic is a problematic situation because a recent study found that coronavirus-related depression was strongly associated with functional impairments, alcohol or drug coping, negative religious coping, extreme hopelessness, and passive suicidal ideation.

Another possible explanation of the poorer mental health during the COVID-19 is related to COVID-19 information overload which has been characterized by contradictory information from different international and local authorities, experts, and scientists with different backgrounds, and mass media.<sup>[9]</sup> Confinement, loss of usual routine, and reduced social and physical contact with others were frequently shown to cause boredom, frustration, and a sense of isolation from the rest of the world was faced by many, which turned out to be distressing for the participants and caused remoteness and a sense of depression. Lack of access to supplies in the lockdown also added on to this effect.<sup>[10]</sup>

#### **Conclusion**:

COVID-19 pandemic is having impact on mental health of the medical students of Gujarat. In present study, depression among the medical students was found because of online teaching method, appointed duty in COVID pandemic, COVID related stigma etc. Early evaluation of depression may help to decide intervention to reduce further depression among the students.

#### Limitation of Study:

Study was conducted by using online data collection platform. Other than COVID-19, various factors can play a role in depression among medical students.

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*Citation:* Several research studies have revealed gap between facts and beliefs of adolescent girls and showed that there is low level of awareness about menstruation among girls when they first experience it.<sup>[4]</sup>

*Journals:* Mehta MN, Mehta NJ. Serum lipids and ABO Blood group in cord blood of neonates. Indian J Pediatr.1984; 51:39-43.

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

*Chapter in the Book:* Malhotra KC. Medicogenetics. problems of Indian tribes. In: Verma IC, editor. Medical genetics in India.vol. 2. Pondicherry: Auroma Entrprises; 1978. p. 51-55.

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પહેલી મે થી રાજ્ય ના હ કોર્પોરેશન વિસ્તાર (અમદાવાદ, વડોદરા, સુરત , રાજકોટ, ભાવનગર, જામનગર, ગાંધીનગર) અને 3 જિલ્લાઓ (મહેસાણા, ભરૂચ અને કચ્છ)માં ૧૮-૪૫ વર્ષના લોકોનું કોરોના રસીકરણ શરૂ થઈ ગયું છે.

> રાજ્યના ૪૫ થી વધુ વચના તમામ લોકો ઓનલાઇન રજીસ્ટ્રેશન કરાવીને અથવા તો સ્સીકરણ કેન્દ્ર પર આધારકાર્ડ કે માન્ય ઓળખપત્ર રજુ કરી રજીસ્ટ્રેશન કરાવી સરકારી હેલ્થ ફેસિલિટીમાં નિઃશુલ્ક રસી લઇ શકે છે.

કોરોના રસીકરણ માટે ૧૮-૪૫ વર્ષના લોકોએ આરોગ્ચ સેતુ એપ અથવા રજીસ્ટ્રેશન પોર્ટલ https://selfregistration.cowin.gov.in પર રજીસ્ટ્રેશન કરાવવું ફરજિયાત છે. રજીસ્ટ્રેશન કરાવ્યા બાદ અનુકૂળ તારીખ અને સમય પસંદ કરીને સરકારી હેલ્થ ફેસિલિટીમાં નિઃશુલ્ક રસી લઈ શકાય છે.

> જો કોરોના થયો હોય તો સાજા થયા બાદ આપના ડોક્ટરની સલાહ લઈને ૪ અઠવાડીયા પછી કોરોનાની રસી લેવી ખૂબ જ જરૂરી છે.

જો પ્રથમ ડોઝ કોવિશીલ્ડ રસીનો લીધો હોચ તો પ્રથમ ડોઝ અને બીજા ડોઝ વચ્ચે ચાર થી આઠ અઠવાડીચાનું અંતર અને જો પ્રથમ ડોઝ કોવેક્સિન રસીનો લીધો હોચ તો પ્રથમ ડોઝ અને બીજા ડોઝ વચ્ચે ચાર થી છ અઠવાડીચાનું અંતર રાખવું જરૂરી છે.

# વધુ માહિતી માટે ડાચલ કરો ૧૦૪ અને ૧૦૯૫.



આરોગ્ય અને પરિવાર કલ્યાણ વિભાગ, ગુજરાત સરકાર દ્વારા જનહિતમાં પ્રસારિત.