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KNOWLEDGE, ATTITUDES AND PRACTICES TOWARDS COVID-19 AMONG MEDICAL UNDERGRADUATE STUDENTS FROM WESTERN INDIA: A CROSS SECTION STUDY

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ABSTRACT: Background: An emerging respiratory disease was abbreviated as COVID 19, after it has been first reported in December 2019 in Wuhan city of China. The major route of transmission of COVID-19 is droplet and close contact. Government of India has initiated training for health care workers at a different level. WHO and CDC also initiated a multidisciplinary approach to tackle COVID-19 of which awareness creation is the main. Thus, the main objective of this study is to assess knowledge, attitude, and practices of medical undergraduates within periphery of Gujarat, India towards COVID-19. **Methods:** In this cross-sectional study, 505 medical students were surveyed online using developed, validated questionnaire during two week period. A p-value of <0.05 indicated statistical significance. **Results:** Among 505 students, 59% (n= 298) are males and 41% (n=207) are females. Medical students have 85 % very good knowledge towards covid-19 which is done during early phase of lockdown (25th march 2020 to 19th May 2020). About 81.6% positive attitude observed in study participants. We discovered that about 341(67.9%) respondents yielded positive practice toward COVID-19. **Conclusion:** Most of medical undergraduate students acquired generally an adequate knowledge, possess a positive attitude, and performed a good practice and proactive behaviours of preventive measures towards COVID-19.

INTRODUCTION: The Index case of the novel corona virus (COVID-19) which is also known as SARS-CoV-2 is officially reported in china and then it spreads to other 213 countries and territories around the world¹. World health organization (WHO) declared a novel COVID-19 outbreak as a global pandemic, on 11th March 2020². In India, the outbreak of COVID-19 was started from 30th January 2020 and the first case was reported in Kerala³.

Worldwide, India stands in the eleventh position, with 106480 confirmed cases and 3301 deaths of COVID-19, as reported on 19th May 2020⁴. Currently, national level dashboard⁵ state level media bulletins syndromic data from sentinel sites and laboratories are used to describe the status of COVID19 in India^{6,7}. But in the early stages of epidemic, such data sources were limited.

This COVID-19 is highly contagious which has an incubation period of 4 to 14 days and the symptoms are fever, dry cough, fatigue, myalgia and breathlessness. Vulnerable population (elderly people or patients with other chronic co-morbidities like Diabetes mellitus and hypertension) are more prone to severe infection. In complicated cases, the patient can suffer from acute respiratory distress syndrome, septic shock, metabolic acidosis and

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bleeding and coagulation dysfunction⁸. In India the case fatality rate is 3.3% which is lower as compared to other countries⁹. Till date, there are no any definitive treatment strategies and vaccine which can fight against COVID-19. In treatment strategy only symptomatic relief is implemented. Moreover, the implementation of preventive measures (frequent hand washing, use of facial mask, sanitizer and social distancing) to control is the mainstay intervention. India has imposed 21-day lockdown from 25th March 2020 lockdown till 14th April to break the chain of coronavirus transmission, followed by, continuing nationwide lockdown till 3rd May 2020 in 75 districts where COVID-19 cases had occurred. Government has suspended all services (small and large business, public transportation, domestic and international flights, closing of public places) except essential ones. Major motive of Government for this lockdown is 'Stay Home Stay Safe'¹⁰.

The fighting against this unseen enemy is still continuing in India. For final victory against COVID-19 require people adherence to control measure. Medical undergraduate students who are future health care providers of the country. So, they should have a thorough knowledge about COVID-19 and in future they can help combat COVID-19 or any other pandemic. It becomes a necessity that they must have updated knowledge regarding corona virus transmission, prevention and management; their knowledge, attitude and practice which can affect the insight of large number of population towards COVID-19. At present, there is no information regarding awareness status of medical undergraduate students in India. Hence, the present study is designed to evaluate the knowledge, attitude and practice of medical undergraduate students towards Covid-19 in Gujarat, India.

MATERIAL AND METHODS:

Study design and Data Collection: A cross-sectional study was carried out immediately after the lockdown declared by Government of India during corona outbreak (between April and May 2020). We enrolled the medical undergraduate students (first year to final year MBBS Students, Interns) from a GMERS Medical College, Dharpur-Patan of Gujarat. We selected online survey by using Google form, because it was not feasible to

conduct community-based survey in this critical pandemic condition. The link of Google form was circulated through WhatsApp. Approximately 15 minutes time has been provided to complete this online survey.

Ethics: The study participants were informed about the details of the study objectives. Informed consent for participation in study was obtained from each participant before starting online survey. Prior ethical approval for study was obtained from Institutional Ethics Committee, with IEC No. 79/2020 dated 30th April 2020.

Study Instrument: The study instrument was prepared from 2020 World Health Research Organization (WHO) training material for the detection, prevention, response and control of COVID-19; and/or CDC guidelines for Covid-19^{11, 12}.

Principle investigator and two co-investigators actively participated in preparing study instrument then it was validated. There were total 30 questions including demographics details like age, gender, study year, domicile and family income (n=09, question no. 1 to 9) where 21 questions of KAP related to clinical presentations, transmission routes, control, prophylaxis and treatment of Covid-19. Among KAP questions, 13 questions were regarding knowledge (question no. 10 to 22), Attitudes toward COVID-19 were calculated by 2 questions (question no. 23: and 24) and 6 questions were regarding practice including Aarogyasetu App (question no.25 to 30). The majority of knowledge questions were answered true/ false with an additional "I don't know" option. Each correct answer was awarded one point and zero point for wrong/unknown answer. So, total knowledge score ranged from 0 to 13, with a higher score representing a better knowledge of COVID-19. In case of attitude question no. 23, each correct answer awarded two point, one point for "don't know" and zero point for wrong answer. Attitude question no. 24 have yes and no response which score one point and zero point respectively. Hence, total attitude score ranged from 0 to 3, with a higher score representing a positive attitude.

Statistical Analysis: The data was entered into Microsoft offices excel and analysed by epi-info

software. Quantitative variables were described using the mean and Standard deviation after checking normality of data which was tested using Kolmogorov test. Qualitative variables were described using the absolute (N) and relative (%) frequencies.

Chi-square test was applied to find difference in knowledge groups (good vs poor) and practice (good vs poor) by demographic characteristics. Independent sample t test and one-way ANOVA analysis were performed in assessing any difference in mean attitude score by demographic characteristics. P-value <0.05 was considered as statistically significance.

RESULT:

Demographic Information: For final analysis, total 505 participants were included in this study. Mean age of participants was 19.6 (SD=1.38, range from 17-21). Out of 505 participants, 59 % (n=298) are males and 41 % (n=207) are females. Majority of study participants were from nuclear family (68.3%, n=345) and urban area (66.1%, 334). **Table 1** shows differences in medical students and interns’ knowledge based on demographics towards COVID 19 and there was significant association between good knowledge and gender, domicile and year of study respectively.

TABLE 1: DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS AND KNOWLEDGE TOWARD COVID-19

Variable	N (%)	Knowledge n (%)		
		Adequate	Poor	P value
Total	505	347 (68.7)	158 (31.3)	
Gender				
Male	298(59)	192 (64.4)	106 (35.6)	0.013*
Female	207(41)	155 (74.9)	52 (25.1)	
Year of study				
1st M.B.B.S	209(41.4)	124 (59.3)	85 (40.7)	0.002*
2nd M.B.B.S	146(28.9)	105 (71.9)	41 (28.1)	
3rd first M.B.B.S	96(19.0)	74 (77.1)	22 (22.9)	
3rd final M.B.B.S	32(6.3)	26 (81.2)	6 (18.8)	
Internship	22 (4.4)	18 (81.8)	4 (18.2)	
Types of Family				
Joint	160 (31.7)	103 (64.4)	57 (35.6)	0.152
Nuclear	345(68.3)	244 (78.7)	101 (21.3)	
Domicile				
Rural	171(33.9)	99 (57.9)	72 (42.1)	0.000**
Urban	334(66.1)	248 (74.3)	86 (25.7)	

*P <0.05, **P<0.001.

Knowledge of COVID-19: More than 90% of study participants correctly answered questions regarding knowledge about common symptoms,

definitive treatment, Mode of spread, avoidance of crowded place, preventative strategies and duration of isolation in COVID 19 infection.

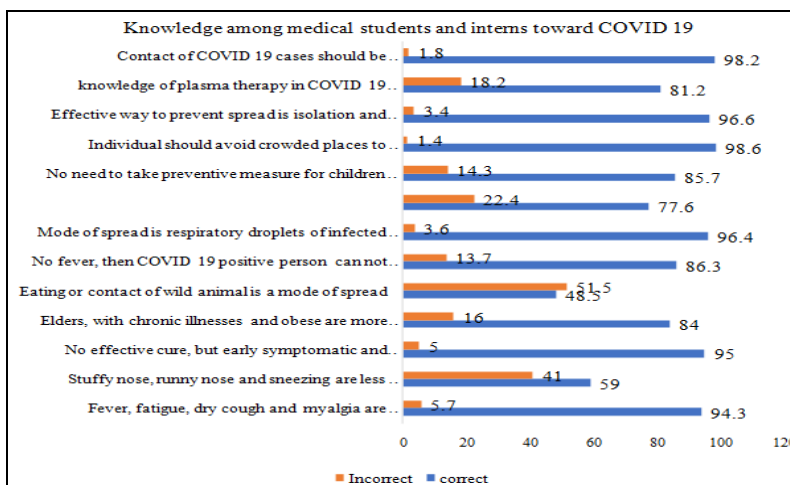


FIG. 1: KNOWLEDGE AMONG MEDICAL UNDERGRADUATE STUDENTS TOWARDS COVID 19

When questions ask regarding wild animal as mode of spread and less common symptoms of COVID 19, 51.5% and 41% study participants respectively were unable to identify correct response as shown in Fig. 1. Based on our analysis, female has good knowledge than male participants Table 1.

Attitude towards Covid-19: About 96.6% of study participants agreed that India can win the battle against Covid 19 virus and 65.7% of study participants agreed that COVID 19 will finally be

successfully controlled. The average attitude score achieved (2.45/3±0.83). Overall, 65.3 % of participants observed more than 80 % score and were categorized as having positive attitude.

Table 2 shows differences in medical students and interns' attitude and practice based on demographics towards COVID 19 and there was significant association between positive attitude with domicile and type of family respectively.

TABLE 2: DEMOGRAPHIC CHARACTERISTICS ASSOCIATED WITH ATTITUDE AND PRACTICE TOWARDS COVID-19 AMONG MEDICAL UNDERGRADUATE STUDENTS

Variable	N (%)	Attitude-N (%)			Practice-N (%)		
		Positive	Negative	p value	Good	Poor	P value
Total	505	330(65.3)	175(34.6)		341(67.5)	164(32.5)	
Male	298(59)	191(64.0)	107(35.9)	0.50	209 (70.1)	89(29.9)	0.13
Female	207 (41)	139(67.7)	68(32.8)		132(63.9)	75(36.1)	
1st M.B.B.S	209 (41.4)	141(67.4)	68(32.5)	0.11	146 (69.8)	63 (30.1)	0.15
2nd M.B.B.S	146 (28.9)	82(56.1)	64(43.8)		95 (65.0)	51 (34.9)	
3rd first M.B.B.S	96 (19.0)	82(85.4)	14(14.5)		69 (71.8)	27 (28.1)	
3rd final M.B.B.S	32 (6.3)	25(78.1)	7(21.8)		21 (65.6)	11 (34.3)	
Intern	22 (4.4)	13(59.0)	9(40.9)		10 (45.4)	12 (54.5)	
Joint	160 (31.7)	93(58.1)	67(41.8)	0.02*	115(71.9)	45 (28.1)	0.15
Nuclear	345 (68.3)	237(68.6)	108(31.3)		226(65.5)	119(34.5)	
Rural	171 (33.9)	99(57.8)	72(42.1)	0.01*	119 (69.6)	52 (30.4)	0.47
Urban	334 (66.1)	231(69.1)	103(30.8)		222 (66.2)	112(33.5)	

N = number, *p<0.05, statistically significant.

Practice towards COVID-19: Fig. 2 represents responses obtained from 6 practice items from study tool. A highest percentage (97.6%) of good practice was observed for visit to crowded places, followed by taking bath after coming back at

home/hostel (94.5%) worn mask (94.1%), keeping sanitizer always (89.5%). A lower percentage (24.6%) of good practice was observed for hydroxychloroquine prophylaxis while working in corona outbreak.

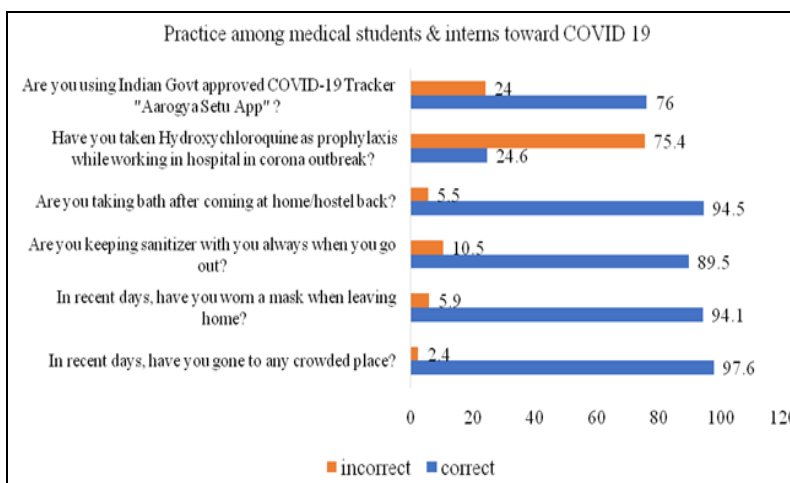


FIG. 2: PRACTICE AMONG MEDICAL UNDERGRADUATE STUDENTS TOWARD COVID 19

DISCUSSION: Corona viral infection is novel highly contagious disease. We have assessed knowledge, attitude and practice of corona virus

among medical undergraduate students from one of the well-known GMERS Medical College Dharpur (Patan) in peripheral area of Gujarat as WHO had

declared infection due to corona virus as global corona pandemic. Their very good knowledge and positive attitude will support health system to fight against COVID-19. Our sample was consisting of 505 medical undergraduate students. Our study shows students have 85% very good knowledge towards covid-19 which is done during early phase of lockdown (25th march 2020 to 19th May 2020) which is in line with other previous studies^{13, 14}. Our unexpected good knowledge of medical students is good analyst for initiation for fight against covid-19. Our result of high level knowledge correct answer rate is mainly due to Arogyasetu app which is key source of information provided by Government of India about virus since start of corona outbreak and 76% students had downloaded that app¹⁵.

All the participants are doing medical undergraduate course is another reason for high good knowledge. Moreover, students may have received information regarding corona virus via television or internet to guide and protect their families during lockdown period. Total 94% students had given correct answer regarding main clinical symptoms of Covid-19 and 95% students knew that no effective and definite treatment available till date. Even WHO and CDC suggested that face mask should be wear only by person who is caring for people suspect covid-19 or person who are sick, our study shows good (78 %) correct knowledge answer rate for question regarding when and whom to wear face mask to prevent spread of infection^{16, 17}. Our study also shows significant low level knowledge in male compared to female and that is also consistent with previous studies^{18, 19}.

Most and last important finding is that significantly low level knowledge is seen in preclinical group. Reason is may be due to they are very younger in all three groups (preclinical, clinical and clinical) and also they are in 1st year of MBBS course compare to other groups who are either in 2nd year or 3rd year or in final year or interns. Hence, level of knowledge is increased as the year spent in the profession increased. We also believe that the high level of knowledge of clinical term students with more clinical rotation, seminar and disease experience is an expected finding^{20, 21}. During COVID -19 outbreaks, 65.7% medical students totally agreed that this corona infection can be

controlled or prevented and 95 % believed that we can win this battle against corona. Both the finding is similar with previous studies^{22, 24}. Possible explanation is that government has taken control measures like traffic limits all over and shut down the cities which enhance student's confidence about winning. Previous studies related to SARS also showed that all kind of extensive public health measures can prevent human to human transmission and eradicate virus^{18, 23}. Positive attitude has found in female compare to male students which are to other previous studies^{22, 24}. We discovered that about 341(67.9%) respondents yielded positive practice toward Covid-19; around 94.1 % wore facemask in public and 89.5% practiced frequent hand washing with sanitizer/soap.

However, these practices towards COVID-19 were similar with the practice of many other countries^{25, 26}. The possible reason for this difference might be due to implementation and encouragement from the government and health educational training provided for the healthcare workers including Arogyasetu app which is used by 76 % participants. Arogyasetu app is an Indian Covid-19 "contact tracing, syndromic mapping and self-assessment" digital service, primarily a mobile app, developed by the National Informatics Centre under the Ministry of Electronics and Information Technology and released in 2020¹⁵. The average scores of practicing preventive measures and satisfaction on the role of local health authorities were higher in male (67.5%) compare to female and these finding contrasts with other previous studies where males were significantly less likely than females to take safety precautions and prevention^{27, 19}.

As suggested by findings from previous studies regarding age and gender patterns of risk-taking behaviours, men and late adolescents are more likely to engage in risk-taking behaviours^{28, 29}. In line with these previous findings, we found significant association between male gender and potentially dangerous practices towards COVID-19 in this study. This study has several limitations. First, this study followed a cross-sectional study design. Therefore, causal inferences may not be established. Second, compared with face-to-face interviews, self-reporting has limitations including

multiple biases. Third, the convenient sampling method, as opposed to random sampling, may not avoid subjective selection bias and thus diminishes the internal validity. Fourth, we used a limited number of questions to measure the level of knowledge, attitude, and practice. Thus, additional assessments would be important, using all aspects of KAP towards COVID-19, to determine the actual extent of KAP.

CONCLUSION: This study is the first investigation on the current KAP related to Covid-19 among medical undergraduate students in peripheral area of Gujarat and it provides valuable insights and evidence to public health education and preventative measures at large in public and government sectors for Covid-19. Results revealed that the overwhelming majority of Indian medical undergraduates had the basic knowledge of Covid-19 with good attitude and positive practice during lockdown period of Covid-19 pandemic.

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