

A Cross Sectional Study of Knowledge, Attitude and Practices Regarding COVID-19 among Students in a Medical College in North India

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ABSTRACT

BACKGROUND

Human coronavirus (HCoV), 2019 novel coronavirus (2019-nCoV), was found in Wuhan, China, which has been responsible for an immense amount of morbidity and mortality world over. In India like in most parts of the world the fight against COVID-19 is an ongoing challenge. People's adherence of the prevention measures is essential for controlling the spread of COVID-19, which is affected by their knowledge, attitudes, and practices (KAP) towards COVID-19. It has been established since the very onset of the pandemic that COVID-19 transmission between individuals occurs most importantly through direct contact as well as by droplets spread by coughing or sneezing of an individual who is infected. Therefore, the key to control of the disease lies having knowledge and adoption of preventive practices. Hence, the study was planned with the objective to assess knowledge, attitude and practice of coronavirus disease (Covid-19) among students in a medical college.

METHODS

This was a cross-sectional web-based study. A questionnaire designed on the basis of published literature and Centre for Disease Control and Prevention (CDC) guidelines was distributed online amongst students in a Medical College in North India. The mean knowledge, attitude, practices as well as demographics of the participants were assessed and scores were assigned for the same. Higher scores represented a better knowledge of COVID-19. Statistical analysis was carried out using Mann Whitney U test for gender and Kruskal Wallis test for age category.

RESULTS

Out of the total students with a non-response rate of 3 %, 398 participants responded, out of whom 54.52 % were males and majority (62.31 %) of the participants were in the age group of 21 - 23 years. Most of the participants were well aware about the modes of spread, main clinical symptoms and precautionary measures required for the prevention of COVID-19.

CONCLUSIONS

The levels of knowledge, attitude and practices were found to be positively adequate amongst most of the participants. Although encouraging, it needs to be reemphasized that continued emphasis on increasing knowledge, attitude and practices towards prevention of coronavirus disease is the key in containing this escalating pandemic.

KEYWORDS

Covid-19, Medical Students, Pandemic, North India

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BACKGROUND

The date December 2019 is fresh in our minds, when yet another deadly pathogenic HCoV, 2019 novel coronavirus (2019 - nCoV), was found in Wuhan, China, which has been responsible for an immense amount of morbidity and mortality world over. The complete picture of devastation is yet not clear as constantly and steadily the situation is evolving.¹

The primary target of the coronavirus is the human respiratory system. Earlier outbreaks of coronaviruses (CoVs) include the severe acute respiratory syndrome (SARS) - CoV and the Middle East respiratory syndrome (MERS) - CoV which have been previously recognized as phenomenal public health threats.² The difference between coronavirus and other enveloped viruses is that its envelope is derived from the endoplasmic reticulum of the host cell and not from the plasma membrane which enhances its pathogenicity.³ Coronavirus disease 2019 (abbreviated "COVID-19") is a dynamic highly infectious respiratory disease that is characterised by clinical symptoms such as fever, cough dry in nature, tiredness, pain in muscles and dyspnea.⁴ Transmission between individuals occurs primarily via direct contact or through droplets spread by coughing or sneezing from an infected individual.²

In India like in most parts of the world the fight against COVI -19 is an ongoing challenge. People's adherence of the prevention measures is essential for controlling the spread of COVID-19, which is affected by their knowledge, attitudes, and practices (KAP) towards COVID-19. After a 14 - hour voluntary public curfew named as 'Janta curfew'. India immediately announced the implementation of a nation - wide complete lockdown for 21 days.⁵ Need for lockdown appears to be an extreme step- whether they will potentiate the needed control measures required to be looked into and will not be isolated from the interaction between authorities and local populations. News media that create panic by reporting a 'killer virus is detrimental to efforts to implement a successful and safe infection control strategy.⁶

This survey was planned and conducted to assess the outlook towards COVID-19 among the students in a medical college during the potentially evolving pandemic who are representative of a population that would play a pivotal role in shaping future preventive strategies in the years to come. The purpose of the study was to assess the outlook of medical students towards COVID-19.

Objectives

- Study the KAP of medical students towards COVID-19 Pandemic
- Assess the KAP scores with respect to demographic characteristics
- Consider effect of prevalent preventive strategies towards mitigating COVID-19 amongst medical students

METHODS

The study was conducted in the month of August 2020 when the medical college was not having contact classes consequent to the nationwide lockdown, but teaching was being conducted through online mode. The data for assessing KAP with regards to coronavirus disease (Covid-19) was obtained from the medical college students via an online self-reported questionnaire which was available online for response by the students for a week. Study design was cross sectional survey which included all medical students of the college. With a non-response rate of 3 %, 398 students participated in the study.

The study participants were informed about the details of the study objectives for filling the questionnaire and confidentiality at the beginning of the survey, and informed consent was obtained from each participant. Their identity will be kept confidential and the results will be used only for research purposes.

The self-designed questionnaire was established on the basis of published literature⁴ and guidelines for the community of Covid-19 by the Centre for disease control and prevention (CDC).⁷ A small pilot study was conducted using this questionnaire to assess its simplicity and difficulty.

12 participants using simple random sampling were selected and administered with the questionnaire online. However, the results of the pilot study were not included in the actual samples used for the study.

The first part of the questionnaire covered demographic information of the participants and the second part contained questions for the KAP assessment. Demographic variables included gender and age. The questionnaire comprised of 8 questions regarding knowledge, 4 for attitude and 5 for practice.

Knowledge questions mainly dealt with the participant's knowledge regarding clinical symptoms, transmission routes, prevention and control of COVID-19.

These questions were responded on a true / false basis with an additional 'I don't know' option. The correct answer was assigned with 1 point and incorrect / I don't know answers were assigned with 0 point. Higher scores represented a better knowledge of COVID-19.

Similar options were assigned for the questions related to attitude while only two options 'Yes' and 'No' were assigned for the questions related to practice towards COVID-19.

Statistical Analysis

The collected data was recorded in a computerised spreadsheet (Microsoft Excel) and statistical analyses were performed using the Statistical Package for Social Science program (SPSS for Windows, version 20, SPSS, Chicago, IL, USA). KAP scores among the students were compared with respect to gender and age-category using Mann Whitney U test for gender and Kruskal Wallis test for age category. The $P < 0.05$ was considered to be statistically significant.

RESULTS

Demographic Characteristics

Table 1 brings out the frequency and percentage of all the demographic characteristics like gender and age. Amongst the 398 participants, 54.52 % were males while the rest were female (45.47 %); Age was divided into three sub categories of 18 - 20, 21 - 23 and ≥ 24 years; most of them were 21 - 23 years old while a much less 13.06 % were ≥ 24. 24.62 % of the participants were in the age group of 18 - 20 years.

Variable	N	Percentage (%)	
Gender	Male	217	54.52
	Female	181	45.47
Age-category (years)	18 - 20	98	24.62
	21 - 23	248	62.31
	≥ 24	52	13.06

Table 1. Demographic Information of the Participants

Knowledge

Table 2 depicts the results of the knowledge survey based on responses to the eight questions. Most of the participants (99.24 %) were aware of mode of spread as well as about the main clinical symptoms (97.23 %). Most (97.48) of them were aware that there is no effective cure and that those with co-morbidities were at higher risk of developing complications. Also, participants (89.44 %) realized that children also need to take precautionary measures against COVID-19.

Questions	True [N (%)]	False [N (%)]	I Don't Know [N (%)]
1. SARS CoV-2 spreads via respiratory droplets generated by the coughing and sneezing of infected people	395 (99.24)	2 (0.50)	1 (0.25)
2. A way of contracting SARS CoV - 2 is by touching a surface or object on which the virus is attached and then touching one's mouth nose or perhaps eyes	384 (96.48)	8 (2.01)	6 (1.50)
3. The primary clinical symptoms of COVID -19 are fever, tiredness, cough dry, pain muscles and breath shortness	387 (97.23)	5 (1.25)	6 (1.50)
4. Close contact or eating wild animals causes COVID-19	107 (26.88)	200 (50.25)	91 (22.86)
5. Afebrile people infected with SARS CoV-2 cannot transmit the virus	32 (8.04)	342 (85.92)	24 (6.03)
6. Although presently there is no effective cure for COVID-19 but instituting early symptom based and supportive treatment aids recovery	388 (97.48)	5 (1.25)	5 (1.25)
7. Older adults and those afflicted serious chronic illness affecting the major organs are at higher risk of developing more serious complications from COVID-19	393 (98.74)	3 (0.75)	2 (0.50)
8. Children as well as young people should also adhere to preventive and precautionary measures to safeguard against SARS CoV-2	37 (9.29)	356 (89.44)	5 (1.25)

Table 2. Results of the Knowledge Survey

Attitude

Table 3 is based on responses to the four questions. It shows that majority (89.44 %) felt lockdown of cities with high

infection rate will help India control the infection. Large number of people (87.93) felt compliance with Ministry of Health guidelines will help control COVID-19 and eventually stop. However, 15.57 % were unable to give a firm response.

Questions	True [N (%)]	False [N (%)]	I Don't Know [N (%)]
1. Lockdown of cities with high infection rate will help India to control the COVID-19 virus	356 (89.44)	22 (5.52)	20 (5.02)
2. Adherence with the Ministry of Health guidelines will prevent the spread of COVID-19	350 (87.93)	15 (3.76)	33 (8.29)
3. COVID-19 will eventually be successfully controlled	239 (60.05)	47 (11.80)	112 (28.14)
4. Do you think schools and colleges should reopen in September	149 (37.43)	187 (46.98)	62 (15.57)

Table 3. Results of the Attitude Survey

Practice

Table 4 is based on the four questions shown above. It brings out that most participants had imbibed healthy preventive behaviours and practices into their day-to-day life such as avoiding shaking of hands, using of hand sanitizer and practicing social distancing. Also, majority (98.49 %) avoided unnecessary travel during the period.

Questions	Yes [N (%)]	No [N (%)]
1. Have you recently avoided cultural behaviours such as shaking hands	384 (96.48)	14 (3.51)
2. Have you been practicing social distancing	386 (96.98)	10 (2.51)
3. Did the outbreak of COVID-19 virus make you increase the frequency of washing hands	382 (95.97)	16 (4.02)
4. Did the outbreak of COVID-19 virus make you use hand sanitizer more frequently	380 (95.47)	18 (4.52)
5. Do you avoid unnecessary travel or outing during the outbreak	392 (98.49)	6 (1.50)

Table 4. Results of Practice Survey

KAP Score Analysis

Table 5 depicts the scores of KAP towards COVID-19 with respect to demographic variables such as gender and age. Statistical analysis was carried out using Mann Whitney U test for gender and Kruskal Wallis test for age category. The knowledge scores of the female were slightly higher than that of males with the difference being significant. However, the attitude scores were higher in males although the difference was not significant. Practice score was found to be higher in females though not statistically significant. The KAP score for the age category was higher in the age group of 18 - 20 when compared to 21 - 23 with no significant difference among groups.

Variable	Knowledge Score			Attitude Score			Practice Score			
	Mean	SD	P Value	Mean	SD	P Value	Mean	SD	P Value	
Gender	Male	6.91	0.81	0.05	2.86	0.92	0.45	3.79	0.66	0.93
	Female	7.07	0.73		2.78	0.91		3.85	0.46	
Age Cat	18 - 20	7.02	0.75	0.29	2.81	0.83	0.83	3.77	0.66	0.26
	21 - 23	6.95	0.81		2.80	0.97		3.84	0.54	
	≥ 24	7.15	0.59		2.89	0.78		3.80	0.44	

Table 5. Analysis of KAP Scores with Respect to Demographic Characteristics

DISCUSSION

In this study, the knowledge, attitude and practice of Covid-19 among the medical students of a medical college in North India was assessed through an online questionnaire. Based on the responses to the questionnaire a positive attitude and adequate knowledge regarding Covid-19 was found amongst most participants. There was no significant difference in knowledge, attitude and practice scores between males and females, however, in a study conducted at China, females were found to have better knowledge score in comparison to the male participants.⁴

No other significant difference was found in mean knowledge, attitude or practice scores as regards in the demographic variables. Considering that the present study assessed only two demographic variables, other demographic variables such as religion can be included in further studies as done by a study in India.⁵ The knowledge, attitudes and practices toward COVID-19 plays a crucial role in assessing society's readiness to accept behavioural change measures imparted by health authorities at an individual as well as community level. KAP studies provide baseline information to determine the type of intervention that may be required to change misconceptions about the virus.⁸ It provides the base on which preventive strategies to combat a pandemic of large-scale proportions as this one. The detection of viral nucleic acid is the standard for non-invasive diagnosis of COVID-19.⁹

Isolation of patients is a consequence of the infection spreading from one person to another and subsequent administration of an array of treatments. Even currently the available antiviral drugs are not specific to the disease.⁹ The virus can remain viable on surfaces for days in favourable atmospheric conditions but are destroyed in less than a minute by common disinfectants like sodium hypochlorite, hydrogen peroxide.¹⁰

Surface disinfection is an important component of any preventive strategy adopted in combating this infection. The coronaviruses already identified might only be the tip of the iceberg, with potentially more novel and severe zoonotic events to be revealed.¹¹ Virus mutation would be adding to the problems encountered in fighting this infection at all stages.

Despite the unprecedented national measures in combating the outbreak, the success or failure of these efforts is largely dependent on public behaviour without which all preventive measures would be meaningless. Specifically, public adherence to preventive measures established by the government is of prime importance to prevent the spread of the disease. In this era of technology when various views, bits and pieces of partially correct and false information is prevalent just at the click of a button it is imperative that people are aware where to seek correct and scientific information. It is here that Government health sources, advisories issued by the ministry, preventive strategies as well as regulations which are rolled out by the Government from time to time is disseminated to the community at large in the shortest span of time. Adherence is likely to be influenced by the public's knowledge and attitude towards COVID-19.¹² Only a realisation that

changes adopted in the Community as a whole would go a long way for any intervention to be effective.

This study brings out that there is adequate knowledge and positive attitude amongst medical students which needs to be spread amongst the community and being future health care handlers, the role played by these students is of paramount importance and needs to be harnessed accordingly. The receptiveness of the people with whom they interact is invariably quite high and it is at this juncture that advocacy by these medical students would go a long way in dissemination as well as adoption of the best preventive health practices taken place by the community as a whole not just for this particular infection but in fact translate into overall better hygiene practices in the lives of most people which in turn would benefit the community. Like other similar studies,¹³ this study revealed that most of the participants were adequately armed with COVID-19 related knowledge, had a positive attitude and involved in preventive practice during the pandemic. Knowledge regarding occurrence of COVID-19 as a result of close contact or eating of wild animals is inadequate and needs to be updated as new literature sheds more light and needs to be kept in mind when creating awareness strategies to prevent this pandemic. Question on whether schools should reopen in September had almost similar number of participants recommending both ways and as evident in our country and as well as other parts of the world remains an elusive question.

Although the results of this study are encouraging, a constant and continuous effort must be made to maintain and continuously update the awareness levels of the medical students in a dynamic fashion as also brought out in another study, as these students are the brand ambassadors in this crucial fight to prevent this escalating pandemic. Medical students form a unique population who are informed, aware with scientific knowledge and knowhow and are bound to interact with the population at large at various levels whether be it at the individual level, hospital level or at the community level. It is at these interactions that maximum dissemination of evidence based scientific and correct preventive measures can be disseminated to the community or individual with whom they mingle. It is hence of paramount importance that these medical students are equipped with the latest guidelines issued from time to time by World health bodies such as WHO, CDC, Indian council of medical research (ICMR) as well as by the Government and health Ministry. It would be the knowledge, attitude and practices followed by these students which would be observed and accepted by the population interacting with them.

CONCLUSIONS

The pandemic is evolving at a rapid and dangerous rate causing morbidity as well as mortality and loss of man hours. The damage caused is further accentuated by the fact that the effects of the pandemic are not limited to only health aspects. The economic impact of coronavirus infections, and the lack of evolving antiviral strategies have made it

evidently clear that our preparation to treat or prevent coronavirus infections are very restricted. Dynamic and effective mitigation is required to reduce person-to-person transmission of COVID-19 and to halt the current pandemic.

Medical students who would be future doctors play one of the most important roles in bringing about behavioural change amongst the community by interacting with them at all levels. They would have to communicate with the various stakeholders who would be responsible in mounting an effective response to combat this infection. It is only with a thorough knowledge of the various aspects of this multipronged approach as well as a positive attitude and correct practices towards COVID-19 that can mount an overwhelming preventive strategy. This strategy would have to be also dynamic in nature as the virus itself, ready to adapt and modify to be able to truly combat this evolving pandemic. Special attention and efforts to protect or reduce transmission should be applied in susceptible populations including children, health care providers and elderly people.⁹ Therefore, ensuring adequate and positive KAP among all strata of population including health care workers (HCW) forms the basis of prevention and control strategy. This study brings out that there is adequate knowledge and positive attitude among medical students regarding COVID 19 disease which needs to be practiced in all earnest as well as disseminated in the community at all levels, and the key is simple but effective preventive strategies such as wearing of face mask, hand sanitization and social distancing would make the biggest impact in halting this pandemic.

Limitations

The study has a unique distinction of being one of its kind conducted in Northern India. However, it is not devoid of limitations. Firstly, since the study was conducted only on medical students, the results cannot be generalised with the population of North India or the country. The study was limited to students of only one college. Only few demographic aspects were taken into consideration since the study sample was limited to medical students. Notwithstanding the limitations, the study was an attempt to assess KAP regarding COVID 19 in a very specific group and bring out the need to conduct larger studies to assess aspects of KAP and acceptance of practices in general population. This would also go a long way in the development of a multi-pronged approach in preventing this pandemic by combination of various factors.

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REFERENCES

- [1] Paules CI, Marston HD, Fauci AS. Coronavirus infections-more than just the common cold. *Journal of the American Medical Association* 2020;323(8):707-708. <https://doi.org/10.1001/jama.2020.0757>
- [2] Rothan HA, Byrareddy SN. The epidemiology and pathogenesis of coronavirus disease (COVID-19) outbreak. *J Autoimmun* 2020;109:102433.
- [3] Ikhtlaq A, Bint-E-Riaz H, Bashir I, et al. Awareness and attitude of undergraduate medical students towards 2019-Novel Corona Virus. *Pak J Med Sci* 2020;36(COVID19-S4):S32-S36.
- [4] Zhong BL, Luo W, Li HM, et al. Knowledge, attitudes and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. *Int J Biol Sci* 2020;16(10):1745-1752.
- [5] Maheshwari S, Gupta PK, Sinha R, et al. Knowledge, attitude and practice towards coronavirus disease 2019 (COVID-19) among medical students: a cross-sectional study. *J Acute Dis* 2020;9(3):100-104.
- [6] The Lancet. Emerging understandings of 2019-nCoV. *Lancet* 2020;395(10221):311.
- [7] CDC. Centers for Disease Control and Prevention: Coronavirus (COVID-19) 2020. <https://www.cdc.gov/coronavirus/2019-nCoV>
- [8] Azlan AA, Hamzah MR, Sern TJ, et al. Public knowledge, attitudes and practices towards COVID-19: a cross-sectional study in Malaysia. *PLoS One* 2020;15(5):e0233668. <https://doi.org/10.1371/journal.pone.0233668>
- [9] Wang L, Wang Y, Ye D, et al. Review of the 2019 novel coronavirus (SARS-CoV-2) based on current evidence *Int J Antimicrob Agents* 2020;55(6):105948.
- [10] Singhal T. A review of coronavirus disease-2019 (COVID-19). *Indian J Pediatr* 2020;87(4):281-286.
- [11] Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet* 2020;395(10223):497-506.
- [12] Al-Hanawi MK, Angawi K, Alshareef N, et al. Knowledge, attitude and practice toward covid-19 among the public in the kingdom of Saudi Arabia: a cross-sectional study. *Front Public Health* 2020;8:217.
- [13] Peng Y, Pei C, Zheng Y, et al. A cross-sectional survey of knowledge, attitude and practice associated with COVID-19 among undergraduate students in China. *BMC Public Health* 2020;20(1):1292. <https://doi.org/10.1186/s12889-020-09392-z>