Original Article

COVID-19 Awareness among Undergraduate Medical Students: A Questionnaire Based Survey

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ABSTRACT

Background: These features of COVID-19 bear resemblance with the infections caused by previously known Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) coronaviruses. India could suffer from outbreak of new strain of COVID-19 or similar pandemic. Lessons learned from the SARS outbreak in 2003 suggest that knowledge and attitudes towards infectious diseases are associated with levels of panic emotion among the population, which can further complicate attempts to prevent the spread of the disease. In the society MBBS students can play a major role in spreading awareness in their society, relations and friend circle.

Aim: To assess the level of awareness and attitude of medical students towards this disease.

Materials and Method: A structured and validated questionnaire on COVID-19 disease and its related infection control practices will be sent to the students through Google form link. The self-administered questionnaire consisting of socio-demographic questions, and 15 questions based on knowledge and infection control practices related to COVID-19 disease in the healthcare setting had been adapted from the current interim guidance and information for healthcare workers published by the CDC, updated on March 7, 2020. Intra-class correlation coefficient (ICC) had been used to assess the reliability of the questionnaire and ICC value was found to be 0.89.

Results: 300 students attempted the questionnaire. More than 70% of the students had knowledge about COVID-19 disease, its causative agent and mode of transmission. However, more than 50% of the students did not know about definition of close contact. 54 students (18.00 %) had answered all the 14 questions correctly. 169 students (53%) had answered 10 to 13 answers correctly.

Conclusion: More efforts should be directed at younger medical students generally. Health Care Authorities should be more involved in the process of education about the pandemic. The lesson learnt from the pandemic should be implemented in any future outbreaks.

Keywords: COVID-19, Awareness, Knowledge, Attitude, Awareness, Medical Students, Pandemics.

QUICK RESPONSE CODE →

INTRODUCTION

COVID-19 has become a pandemic and it is a topic of high public concern and medical students are directly or indirectly related to it. Many people reported to different hospital in Wuhan, China with the complaints of fever, headache, and shortness of breath, malaise and dry cough in mid-December 2019. They were admitted as cases of atypical pneumonia. Some of them developed complications as the disease progressed. They developed respiratory failure and were given ventilatory support. [1]

On December 12, 2019, the first case of this type of pneumonia was detected. The possibilities of other coronaviruses, influenza and other such diseases were ruled out by laboratory diagnostics. It was announced by the Chinese authorities on January 7, 2020 that a new strain of coronavirus was discovered and isolated in those patients. World Health Organization (WHO) provisionally named this virus as 2019 novel coronavirus (2019-nCoV) on January 12, 2020. The disease caused by this virus was termed as Coronavirus Diseases of 2019 (COVID-19) on Feb 11, 2020 and the virus was renamed as Severe Acute Respiratory Syndrome 2 Coronavirus (SARS-2 coronavirus).[2]

As of March 2020, there were a total of 142,539 reported cases of COVID-19 globally, with 5393 deaths. The pandemic had spread to many countries with extension to 13 more countries in just 24 hours. [3]

2019-nCoV belongs to the family Coronaviridae (commonly called Coronavirus). Coronaviruses are enveloped RNA viruses known to cause respiratory,

hepatic and neurological diseases. [4] They have a wide distribution among birds, mammals, and humans. [5] Six species of coronaviruses have been identified to cause disease in human. Out of these six, four --- 229E, OC43, NL63, and HKU1 --- are quite prevalent and cause symptoms of common cold in immunocompetent people.[6]

Coronavirus differs from other enveloped viruses in its replicative cycle by the fact that its envelope is derived from the endoplasmic reticulum of the host cell not from the plasma membrane. This may add to its pathogenicity. [7] Envelope (E) proteins, Membrane (M) proteins and Spike (S) proteins have been identified in coronavirus. [8] S-proteins have been found to have a role in the recognition and attachment of the virus to the Angiotensin Converting Enzyme 2 (ACE-2) receptors of the human epithelial cells in the respiratory mucosa. [9] These features of COVID-19 bear resemblance with the infections caused by previously known Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) coronaviruses.[10]

India could suffer from outbreak of new strain of COVID-19 or similar pandemic. To guarantee the final success, people's adherence to these control measures are essential, which is largely affected by their knowledge, attitudes, and practices (KAP) towards COVID-19 in accordance with KAP theory. [11, 12] Lessons learned from the SARS outbreak in 2003 suggest that knowledge and attitudes towards infectious diseases are associated with level of panic emotion among the population, which can further complicate attempts to prevent the spread of the disease. [13, 14]

In the society MBBS students are considered as reliable source for medical information. They can play a major role in spreading awareness in their society, relations and friend circle. They can guide people in taking proper methods of prevention, symptoms of COVID-19, taking clinical consultations etc.

This study will be done to assess the awareness of COVID-19 disease and its related infection control practices among undergraduate students in the Indian healthcare scenario. Medical Students are directly or indirectly related to such epidemics. So, they must have a higher level of knowledge and better attitude towards such diseases. That's why our objective was to assess the level of awareness and attitude of medical students towards this disease.

MATERIALS AND METHODS

A questionnaire based cross-sectional study was carried out at department of pharmacology of tertiary care centre of eastern India in March 2020 after approval from Institutional Ethics Committee. The population under study consisted of Undergraduate Medical Students who were willing to participate were included.

The minimum sample size was calculated (through RaoSoft, using the formula, n = Z2*P (1-P)/m2) to be 214

with a 95% confidence interval and 5% error margin. Using random sampling, 300 participants were recruited in the study subsequent to receiving informed written consent.

A structured and validated questionnaire on COVID-19 disease and its related infection control practices will be sent to the students through Google form link. The self-administered questionnaire consisting of socio-demographic questions, and 15 questions based on knowledge and infection control practices related to COVID-19 disease in the healthcare setting had been adapted from the current interim guidance and information for healthcare workers published by the CDC, updated on March 7, 2020. [12] The questionnaire also include questions related to hand hygiene techniques based on the "five moments of hand hygiene" described by the WHO, which was used to test participants' knowledge in optimal hygiene practices. [13] Intraclass correlation coefficient (ICC) had been used to assess the reliability of the questionnaire and ICC value was found to be 0.89.

Statistical Analysis

The response obtained from students was presented in tabular form and data was then transferred into IBM-SPSS software version 25.0 for analysis and validation. The qualitative variables were presented in the form of frequencies and percentages. Information was expressed in the form of tables.

OBSERVATIONS AND RESULTS

Table 1: Baseline Demographic and Clinical Characteristics (n = 300)

Characteristic	Participants	Percentage (n = 300)
Sex		
Female	124	41.33
Male	176	58.67
Age		
Group A (18-25 years)	224	74.67
Group B 25 (>years)	76	25.33
Year of Study		
1st Year	76	25.33
2nd Year	121	40.33
3rd Year	62	20.67
4th Year	41	13.67

Most of the study participants were male of 18-25 years of age. Most of the students who participated in our study were of 2nd year of study in the MBBS course.

Questionnaire

1. The Virus causing COVID-19 infection is called:
   A.   SARS
   B.   SARS-CoV-2
   C.   2019-CoV-2
   D.   2019-nCoV
   Ans: D

2. First reports of cases were from Wuhan city in the Hubei province of China.   **True/False**
   Ans: True

3. The main mode of transmission of virus from person to person is via:
   A.   Respiratory droplets
   B.   Spread from contacts with contaminated surfaces or objects
   C.   Both of Above
   Ans: C

4. Which of the following is considered as "close contact"?
   A.   Being within approx. 10 feet (3 meters) of a patient with COVID-19 for a prolonged period of time
   B.   Being within approx. 6 feet (2 meters) of a patient with COVID-19 for a prolonged period of time
   C.   Having direct contact with infectious secretions (sputum, serum, blood) from a patient with COVID-19
   D.   Both B & C
   Ans: D

5. Reported illnesses have ranged from mild to severe symptoms of cough, fever, breathlessness, which can appear 2-14 days after exposure. For which of the following situations is medical advice indicated?
   A.   Have been in close contact with a person known to have COVID-19
   B.   Currently residing in an area with ongoing COVID-19 infection
   C.   Recent travel from an area with ongoing spread of COVID-19
   D.   All of the Above
   Ans: D

6. Did you receive formal training in hand hygiene?   **YES/NO**
   Ans: Yes

7. Which of the following hand hygiene actions prevents transmission of the virus to the health-care worker?
   A.   After touching a patient
   B.   Immediately after exposure to body fluids
   C.   After exposure to the immediate surroundings of the patient
   D.   All of the above
   Ans: D

8. Preferred method of hand hygiene for visibly soiled hand is
   A.   Hand rub with soap and water for at least 10 seconds
   B.   Hand rub with soap and water for at least 20 seconds
   C.   Use of alcohol based hand sanitizer with at least 60% alcohol
   Ans: B

9. Use of a face mask is not essential in which of the following groups?
   A.   People who are alone at their home or room.
   B.   People in area where there are no COVID cases.
   C.   Being in close contact of a person suspected of or known to have COVID-19 infection.
   D.   Healthcare professionals
   Ans: A

10. Which of the following is the most effective method for prevention of COVID-19 infection in present healthcare setting?
    A.   Avoiding exposure (using standard precaution such as Mask, PPE kit)
    B.   Vaccination
    C.   Taking multivitamins
    Ans: A

11. What personal equipment (PPE) should be worn by individuals transporting patients who are confirmed case COVID-19?
    A.   Gloves and mask
    B.   Gown
    C.   Eye protection
    D.   All of the above
    Ans: D

12. What would you recommend to a peson who has come to direct contact with COVID-19 patient and is asymptomatic and apparent healthy?
    A.   Refer him to a COVID hospital.
    B.   Recommend him to stay normally at home with his family.
    C.   Recommend him to stay in most separate corner of his home with minimum interaction with his family members.

Ans: C

13. When asked to visit a person who has fever and breathlessness. What should you do?
   A.   Visit the patient with mask and advise him to get tested.
   B.   Deny the visit and tell them to take some antibiotics and paracetamol.
   C.   Deny the visit, talk to patient on phone and advise him to talk to COVID helpline number.
   Ans: C
14. What should your advice to a mother who was in contact of COVID-19 patient and has mild cough?
   A.   Wash her hand regularly, put mask and use formula milk powder instead of breastfeeding.
   B.   No need of taking precaution as children and infant are not susceptible to COVID-19.
   C.   Wash her hand regularly, use mask and breastfeed her child.
   Ans: C

Table 2: Frequency of Correct Responses to Each Question (n = 300)

Knowledge Aspect	Number of Students giving Correct Answer	% of Students giving Correct Answer
1. Causative agent of COVID-19	278	92.67
2. Place of outbreak	287	95.67
3. Mode of transmission	214	71.33
4. Definition of close contact	154	51.33
5. Population at risk	197	65.67
6. Hand hygiene training	236	78.67
7. Time of hand hygiene	247	82.33
8. Method of hand hygiene	184	61.33
9. Use of face mask	211	70.33
10. Prevention of COVID-19 infection	244	81.33
11. PPE kit	234	78.00
12. Measures taken after direct contact	210	70.00
13. Instruction to patient with symptom of COVID-19	196	65.33
14. Instruction to nursing mother with COVID-19 symptoms	179	59.67

More than 70% of the students had knowledge about COVID-19 disease, its causative agent and mode of transmission. However, more than 50% of the students did not know about the definition of close contact. More than 70% of students were aware about preventive measures but nearly 40% students didn't know proper method of hand hygiene.

Table 3: Distribution of students according to scores obtained (n = 300)

Score	Number of Students	% of Students
14	54	18.00
13	45	15.00
12	41	13.67
11	46	15.33
10	27	9.00
9	24	8.00
8	21	7.00
7	19	6.33
6	6	2.00
5	8	2.67
4	6	2.00
3	3	1.00
≤2	0	0.00

300 students attempted the questionnaire. 54 students (18.00 %) had answered all the 14 questions correctly. 169 students (53%) had answered 10 to 13 answers correctly. 17 students (5.66%) were able to answer less than 6 questions correctly.
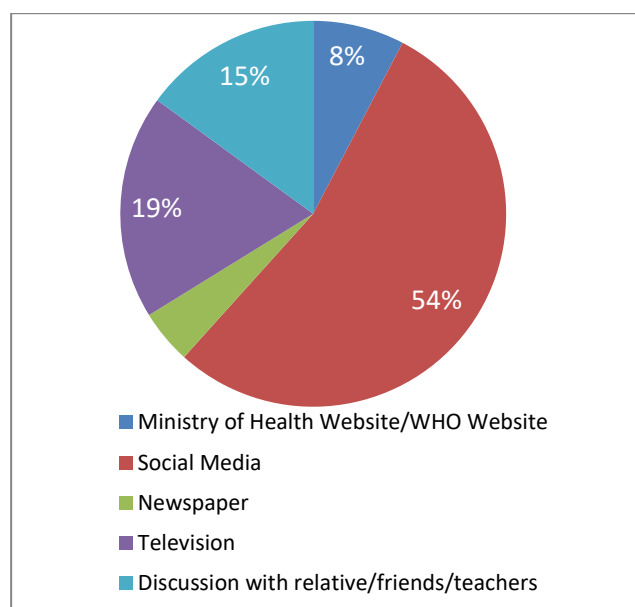

Figure 1: Distribution of Students about Source of Knowledge about COVID 19

Table 4: Source of Knowledge about COVID 19 (n =287)

Source of Knowledge	Number of Students	% of Students
Ministry of Health Website/WHO Website	22	7.67
Social Media	155	54.01
Newspaper	13	4.53
Television	54	18.82
Discussion with relative/friends/teachers	43	14.98

DISCUSSION

We found that more than half percentage of people relied on social media as a source of information. This is in accordance with previously done KAP studies on a previous strain of coronavirus (MERS-CoV). [15-16] Social media as a source of information is a two-way street. On one hand, it is cost-effective, wide-dispersal and easily accessible source while on the other hand, it spread fake information. Fake news and false information can have devastating effects on the society. [17-18] It puts an increased liability on health care authorities to enhance the availability and approachability of required authentic information by using varied and effective means of communication. Medical students should carefully evaluate of coronavirus related awareness materials before sharing or applying it.

A healthy relationship between the availability of information in the media and the level of awareness among medical undergraduates is established in the findings of this study. Examples elaborating this relationship are awareness of more than 60% of the participants about the precautionary actions, about the mode of spread, about infecting agent, and of participants about the presenting complaints. These results concord with the conclusions of previous surveys. [19-20] Only a very few respondents knew about definition of close contact. One reason might be that it is not well illustrated on media and as the major source of knowledge of medical students about coronavirus is social media and television so they did not know about it. On the other hand, large numbers of respondents were aware of incubation period. This shows a better awareness level of medical students about coronavirus than that showed for other strains of coronaviruses in previously conducted surveys. [19]

In this study, more than 70% medical students had enough knowledge about coronavirus. The results point out the need for better and systemized efforts to increase the level of awareness among medical students. As anticipated, year of study was appreciably linked with higher levels of information. Students having a higher year of study showed higher level of knowledge and awareness. Previous studies on other strains of coronavirus showed an association between age and level of knowledge. [15] Educational programs should be intended to target the professions with established lower level of awareness, i.e. in our study this turns out to be students who were in their initial year of study.

Most of the respondents had a generally encouraging outlook towards contribution in infection control campaigns and awareness programs. However, it is important to note that nearly 20% respondents were not worried that one of their family members might get an infection. There is a need of proper awareness about the gravity of the condition by using accessible and potent means of information. A large number of respondents did not know about the instruction that should be given to nursing mother with COVID-19 symptoms. The reason might be a communication gap between the masses and the government. There is a dire need for health care authorities to improve their communication with the masses and to increase the confidence of a common man in health control programs. This can be done by social media campaigns, seminars, awareness advertisements and improving the curriculum.

A negative attitude towards immunization was shown by some of the respondents. Most of the participants believed that maximum information available about the disease must be availed. Majority agreed with the grimness of complications by agreeing with the intensive care of the diagnosed patients. These findings are concurrent with previous surveys on other strains of coronavirus. [15, 19, 20]

As per WHO recommendations, Indian government has directed the health care authorities to establish enlightening crusade aimed at awareness about the prevention, treatment and symptoms of coronavirus. [21] However, greater endorsement is needed for health care workers especially and all medical students generally to refer to the authentic sources for awareness and knowledge about coronavirus.

Limitations of the study

The study was done in a single medical institute in tertiary care hospital and medical college of eastern India, thus the results shown here may not be applicable to other areas of the country. Conduction of extensive studies from other regions is important to investigate awareness and attitude of students' nationwide level.

CONCLUSION

The undergraduate medical students showed a satisfactory level of awareness and positive attitudes towards coronavirus with an obvious difference in awareness level between various disciplines. Better educational efforts with effective techniques are pointed to further increase the level of awareness and to suffice for the shortcomings. More efforts should be directed at younger medical students generally. Health Care Authorities should be more involved in the process of education about the pandemic. The lesson learnt from the pandemic should be implemented in any future outbreaks.

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