

COVID-19 Awareness among Healthcare Students and Professionals at a Tertiary Care Institute in India

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Received: 01-11-2021 / Revised: 29-11-2021 / Accepted: 18-12-2021

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Conflict of interest: Nil

Abstract

Background: The rapid and extensive spread of the COVID-19 pandemic has taken a huge toll on the healthcare profession. The healthcare workers on the frontlines are particularly vulnerable to this infection and are also at high risk of burden of extended work hours, physical and psychological stress, burnout and fatigue. Not only the doctors but also the medical and paramedical staff, medical students as well as people working and studying in allied health sciences are exposed to high risk of COVID-19 infection as they are surrounded by a high viral load. Lack of awareness may put themselves and their communities in danger of infection with COVID-19 .

Materials and Methods: A questionnaire-based survey on the awareness, knowledge and infection control practices carried out in COVID-19 out of which a total of 246 responders completed the survey. Convenient sampling method was used for data collection which was represented as frequencies and percentages. The individuals correct responses were compared with the average number of correct responses and presented in a tabular form.

Results: The highest percentage of response was from medical professionals with that of 90.00% and lowest percentage was among paramedical sciences with that of 81.82%. The highest correct response was observed in the age group of 18-30 years with 86.02%. Females had a slightly higher correct response rate with a difference of 2%. Participants who received hand hygiene training had a higher correct response rate with difference of 3%.

Conclusion: There is a strong need for periodic intervention and education regarding COVID-19 infection control practices. There should be a conductance of periodic webinars and interventions across all healthcare professions including non-clinical and administrative staff, paramedical and nursing sub-groups to reduce the chances of infections amongst these groups.

Keywords: Corona virus, COVID 19, Health care professionals, Health care workers

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Introduction

Coronavirus disease 2019 (COVID-19) being highly contagious, has had a catastrophic effect on the world's demographics, emerging as the most consequential global health crisis since the era of the influenza pandemic of 1918.[1]

Coronaviruses are positive single stranded RNA viruses.[2] The SARS-COV2 pandemic started in Wuhan, China, in December, 2019[2]. SARS coronavirus (SARS-CoV-2) uses angiotensin-converting enzyme 2 (ACE2) as a receptor. The virus is thought to have originated in bats. SARS-CoV-2 is prone to genetic evolution resulting in multiple variants, hence periodic genomic sequencing of viral samples is must in the pandemic era. [2]

The effects on the respiratory system include early and late phase pneumonia, severe activation of the immune system leads to a cytokine storm. [3] Severe COVID-19 infection may lead to pulmonary edema. [3] The clinical spectrum of COVID-19 varies from asymptomatic forms to clinical illness characterized by acute respiratory failure requiring mechanical ventilation, septic shock, and multiple organ failure. [3] The diagnostic testing for COVID-19 includes molecular testing (real time PCR), serological testing, chest x-ray, chest computed tomography, laboratory assessment. [3]

The rapid rate of spread of COVID-19, makes healthcare professionals and students vulnerable to acquiring the infection. [4] In addition, the pandemic has brought an increasing work load, high levels of stress, burnout and fatigue. [4] Hence this study aims to assess the awareness about COVID-19, in the form of a questionnaire-based study at a tertiary healthcare institute in India. The main objective of the current study is to evaluate the knowledge of the preventive measures taken against COVID-19, since that is the major tool to fight the ongoing pandemic.

Materials and Methods

Shah *et al.*

A questionnaire was prepared and circulated among healthcare personnel medical students, dental (students and professionals), physiotherapy, nursing students, healthcare professionals, non-clinical staff, medical post graduates and allied health sciences). All the individuals were of age above 18 years of age. Consent was obtained from all the participants. The institutional ethics committee reviewed and approved all study related documents.

The survey was conducted in a tertiary care hospital and teaching institute in Nashik. The survey was circulated among 500 potential responders out of whom approximately 246 responded.

The data was collected and analyzed in a percentage form. The individual's correct responses were compared with the average number of correct responses and presented in a tabular form.

The questionnaire was circulated online in the form of a google form. The questionnaire contained socio-demographic questions such as the age, gender, and profession as well as 16 questions based on knowledge and infection control practices related to COVID-19 disease. The questionnaire also included questions related to hand hygiene techniques based on the "five moments of hand hygiene" described by the World Health Organization (WHO). The questionnaire also contained questions on the source of obtaining information about COVID-19 and the type of mask used by the participant.

Convenient sampling was used for data collection, and the distribution of responses was presented as frequency and percentages. Subgroups were classified on the basis of gender (male and female), age (18-30 years, 31-45 years, and >45 years) and profession (undergraduate, post-graduate students, fellows and faculty, paramedical sciences containing dental, nursing, and physical therapy schools and institutes, non-clinical staff and

administrators, paramedical staff, and professionals from the allied health sciences). Sub-groups were also classified on the basis of the training received by the responders for hand hygiene procedures. Data were tabulated in excel, and

descriptive statistics were performed using SPSS 17 software. Individual pairwise comparisons were done using the median test for percent correct response.

Result:

Table 1: Demographic Data

Age	Number of participants
18 to 30 years	186
31 to 45 years	10
above 45 years	50
Gender	
Male	113
Female	133
Profession	
Medical students	86
Medical Post-graduates (residents, fellows, faculty)	80
Paramedical sciences [dentistry (students and faculty), Nonclinical/administrative staff, nursing (students and faculty), allied health sciences]	80

Table 2: Percentage of Correct Responses according to age of Participants

Age	18 to 30 years (n=186)		31 to 45 years(n=10)		45 years and above (n=50)	
	Number of correct responses	% of correct responses	Number of correct responses	% of correct responses	Number of correct responses	% of correct responses
q-1	68	36.56%	2	20.00%	13	26.00%
q-2	177	95.16%	8	80.00%	50	100.00%
q-3	180	96.77%	8	80.00%	50	100.00%
q-4	86	46.24%	6	60.00%	39	78.00%
q-5	160	86.02%	10	100.00%	43	86.00%
q-6 yes	172	92.47%	5	50.00%	31	62.00%
q-6 no	14	7.53%	5	50.00%	19	38.00%
q-7	79	42.47%	9	90.00%	34	68.00%
q-8	180	96.77%	9	90.00%	4	8.00%
q-9	152	81.72%	8	80.00%	37	74.00%
q-10	183	98.39%	10	100.00%	48	96.00%
q-11	183	98.39%	8	80.00%	46	92.00%
q-12	178	95.70%	10	100.00%	50	100.00%
q-13	160	86.02%	10	100.00%	45	90.00%
q-14	132	70.97%	4	40.00%	18	36.00%
q-15	181	97.31%	10	100.00%	5	10.00%
q-16	140	75.27%	8	80.00%	42	84.00%

Median		86.02%		70.00%		78.00%
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Table 3: Percentage of Correct Responses According to Gender of Participants.

Gender	Female (n=133)	Male (n=113)
Question number	% of correct response	% of correct response
q-1	34.59%	34.51%
q-2	98.50%	97.35%
q-3	99.25%	99.12%
q-4	89.47%	85.84%
q-5	89.47%	84.07%
q-6 yes	78.20%	75.22%
q-6 no	22.56%	24.78%
q-7	66.92%	0.62%
q-8	87.97%	85.84%
q-9	66.92%	56.64%
q-10	97.74%	92.04%
q-11	96.99%	92.92%
q-12	96.99%	94.69%
q-13	89.47%	92.92%
q-14	39.10%	34.51%
q-15	93.98%	92.92%
q-16	87.97%	91.15%
Median	89.47%	85.84%

Table 4: Percentage of Correct Responses According to Profession of Participants.

Question number	Medical students		Medical post graduates		Paramedical sciences	
	Number of students given correct response (n = 86)	correct responses%	(Residents, fellows, faculty)		(Students and faculty)	
			Number of students given correct response (n = 80)	correct response%	Number of students given correct response (n = 80)	correct response%
q-1	33	38.37%	42	76.36%	29	36.36%
q-2	85	98.84%	79	98.75%	80	100.00%
q-3	84	97.67%	79	98.75%	80	100.00%
q-4	66	76.74%	72	90.00%	72	90.91%
q-5	52	60.47%	57	71.25%	42	54.545
q-6 yes	60	69.77%	60	75.00%	36	45.45%
q-6 no	26	30.23%	37	46.25%	43	54.55%
q-7	30	34.88%	58	72.50%	43	54.55%
q-8	60	69.77%	71	88.75%	80	100.00%
q-9	43	50.00%	60	75.00%	43	54.55%
q-10	84	97.67%	76	95.00%	65	81.82%
q-11	83	96.51%	78	97.50%	80	100.00%
q-12	84	97.67%	78	97.50%	80	100.00%
q-13	81	94.19%	75	93.75%	65	81.82%

q-14	78	90.70%	55	68.75%	7	9.09%
q-15	82	95.35%	76	95.00%	80	100.00%
q-16	75	87.21%	74	92.50%	80	100.00%
median		87.21%		90.00%		81.82%

Table 5: Percentage of Correct Responses According to Formal Training in Hand Hygiene Received by Participants

Questions	Percentage of correct responses (%)	
	Yes	No
q-1	34.24%	41.94%
q-2	99.46%	96.77%
q-3	98.91%	98.39%
q-4	86.96%	88.71%
q-5	86.41%	87.10%
q-6 yes	64.13%	64.52%
q-6 no	85.33%	90.32%
q-7	62.50%	59.68%
q-8	96.20%	90.32%
q-9	95.65%	91.94%
q-10	96.74%	91.94%
q-11	91.85%	87.10%
q-12	40.76%	41.94%
q-13	95.11%	87.10%
q-14	88.59%	90.32%
q-15	88.59%	88.71%
q-16	34.24%	41.94%
median	99.46%	96.77%

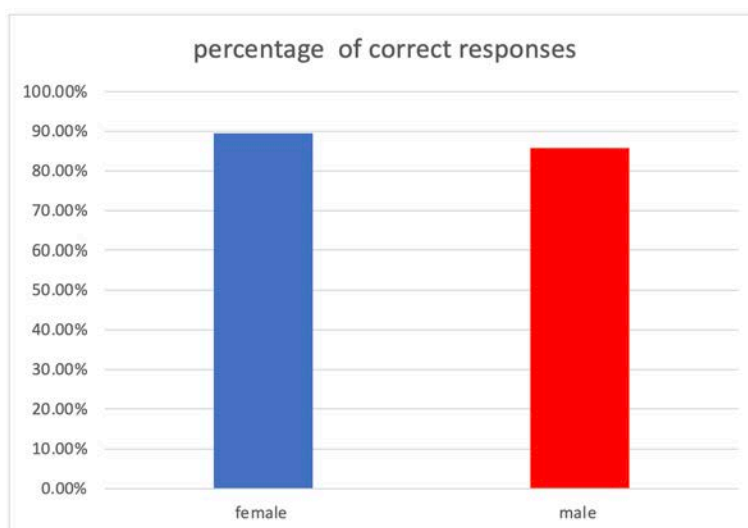


Figure 1: Percentage of correct responses based on gender

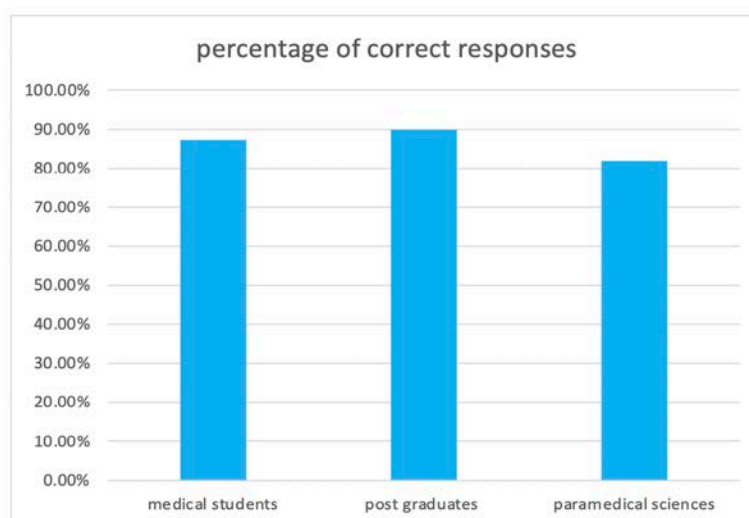


Figure 2: Percentage of correct responses based on profession

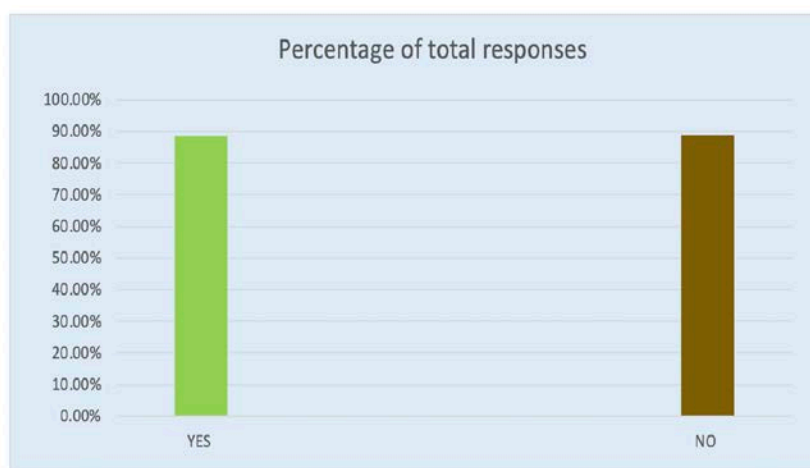


Figure 3: Formal training in hand hygiene

Results:

Out of a total of 246 responded to the survey of which 43.6% was male and 56.4% were females (Table 1)

Females have had a slightly higher correct response rate as compared to males which the difference of approximately 3%. (Table 3, Figure 1)

Among the various sub-groups 34.9% (n = 86) of the medical students and 32.5% (n = 80) of the medical professionals and postgraduates, (including resident, fellows, and faculty) completed the survey. Median of age 18 to 30 years is the highest among all age groups in term of the percentage of correct responses. (Table 2, Figure 2)

The majority of the responders were from the age group of 18-30 years (n = 186). (Table 2, Figure 3)

Medical professionals followed by medical students had a high correct response rate and the non-clinical staff had the lowest response rate. (Figure 2)

Only 33.5% of the responders were aware that COVID-19 is called severe acute respiratory syndrome coronavirus – 2 (SARS – CoV-2) as well as 2019-nCoV. (Table 4)

About 98.7% responders were aware that COVID-19 was first reported in Wuhan, China. About 98.7% responders were aware that COVID-19 spread from

respiratory droplets. About 98.6% of responders were aware of the symptoms of COVID-19. (Table 4)

About 68.7% of the individuals were able to define “close contact” with the highest response rate among post-graduate students and lowest among allied health sciences. A high response rate was observed among medical students as well as professionals. (Table 4)

A total of 75% of the responders received hand hygiene training where medical students (82%) had highest number and the lowest number was among dental students and non-clinical staff. (Table 4)

About 86% of responders were aware of the hand hygiene required to prevent the transmission of COVID-19 virus with a similar correct response rate in people who received hand hygiene training and those who didn't. An almost equal correct response to the questions was observed among individuals who have received hand hygiene training and amongst those who haven't. (Table 5)

About 94.3% of individuals were aware of the categories for which it is essential to use face mask. (Table 4)

About 94.5% of individuals were aware that avoiding exposure as well as vaccination is the most effective methods to prevent COVID-19 infection. (Table 4)

About 95.3% of the individuals were aware of the PPE to be worn when dealing with patients suspected or confirmed to have COVID-19. About 90.3% of individuals were aware of the PPE to be worn by health care provider when providing care to asymptomatic patients. (Table 4)

Only 38.6% of responders were aware that air borne infection control room without exhaust is recommended for isolation of COVID-19 patients. 88.6% of responders were aware that all aerosol generating procedures should be done in an air borne infection control room. (Table 3)

Discussion:

Since the onset of the covid-19 in December of 2019, it has been a constant battle where the virus has become a burden not only on the physical and mental health, economy, employment, industries and also on the government with over 31.3 crore people being affected worldwide till January of 2022. Hence effective management of the pandemic can maximally reduce losses. The correct information is necessary to be known especially among healthcare workers who are at the frontline, in order to protect themselves and society. [4] One of the questions was about the source of procuring information about COVID-19 of which 50.8% of the responders filled official websites (WHO, etc.), the other options being social media and news outlets. [5] Social media has been notorious for spreading false information regarding COVID-19 disease, prevention, treatment as well as vaccination. This has created a scare among individuals as well as made them complacent to take precautionary measures. [5]

The other question was about which type of mask do you use of which 60.6% responded with respirator (n-95), the other options being cloth and surgical mask. The N-95 mask is the preferred mask in individuals who are in close contact with suspected or positive patients of COVID-19. [6] Those who are not in close contact are advised to use surgical masks or cloth masks. [6] Respirators have been shown to reduce the spO₂ level and increase heart rate compared to standard surgical masks. [6]

Only 33.5% of the responders were aware that COVID-19 is called severe acute respiratory syndrome coronavirus – 2 (SARS – CoV-2) as well as 2019-nCoV.

The role of media with respect to acquiring information about the disease, could be highlighted as media outlets rarely use the term 2019-nCoV. [7]

The ability to identify close contact ensures that the healthcare worker will be able to take appropriate preventive measures. [8] An important measure for prevention of COVID-19 infection is maintenance of social distancing especially for health care workers who are highly exposed to the viral burden, which makes it essential to identify close contacts.[8] A well-designed curriculum which includes pandemic management is helpful in understanding prevention of COVID-19 and the same has been included in the Competency Based Medical Education (CBME) curriculum for MBBS students from 2021 onwards in INDIA.

A large number of medical students have received hand hygiene training whereas no such curriculum is in place for non-clinical staff. The WHO "Five Moments of hand hygiene" defines key moments when healthcare providers must carry out hand hygiene.[9] Two basic methods to clean hands are hand washing and hand rubbing.[9] The US Centres for Disease Control and Prevention (CDC) recommends alcohol-based hand rub (ABHR) in most situations.[9]

Most of the participants were aware of that face mask is one the most important tools in preventing transmission of the disease. Face mask has been one of the major tools in reducing the transmission of COVID-19 in public places as it is mainly spread through respiratory droplets.[10] CDC advises to cover your mouth and nose with face mask.[10] It has been made compulsory to dawn face mask in public places in many countries including India. [10]

All healthcare workers are high risk group in terms of acquiring the disease, as they are in close contact with COVID positive cases hence vaccination is a prerequisite along with taking preventive measures. Vaccination reduced the attack rate adverse outcomes, ICU admissions, non-ICU hospitalizations and deaths especially

Shah *et al.*

among individuals above 65 years of age. [11]

The donning and doffing of PPE are an essential skill for healthcare workers as it is a shield from getting contaminated with SARS-Cov-2. WHO recommends the use of medical mask, face shield, gloves, respirator, gown and goggles for those in close contact with suspected or positive cases of COVID-19. [12] Options not recommended by WHO are reusing PPE, inappropriate use of gloves and wearing medical mask over respirator. Non-medical masks are not an appropriate alternative for respirators. [12]

An air borne infection control room without exhaust is used for isolation of confirmed positive cases of COVID-19. Exhaustion of the air in the room can be a cause of further spread of the virus. Aerosol generating procedures can have higher rates of spreading infection, hence they are conducted in air borne infection control rooms. [13]

Conclusion:

The highest percentage of correct response was from medical students and lowest percentage was among allied health sciences. There has been an introduction of pandemic module in the CBME curriculum which has impacted the knowledge and attitudes of the medical students towards pandemic management. Such interventions need to be made to train the allied health sciences and nursing (students and faculty) as well. Periodic educational interventions in the form of seminars, hands on training, etc. should be emphasized on. The management of the pandemic lies in stopping the chain of transmission; hence prevention is the best cure.

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