

# Knowledge, Attitude, and Practices Regarding Coronavirus Disease 2019 Protocols among Doctor's Nurses, Technicians at District Hospital Vidisha – A Pre- and Post-Intervention Analysis

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## ABSTRACT

**Aim:** The aim of the study was to conduct a pre- and post-intervention analysis of knowledge, attitude, and practices regarding coronavirus disease 2019 (COVID-19) protocols among doctor's nurses, technicians.

**Materials and Methods:** Study was carried on the doctors, staff nurse, technicians, and working in hospital. A scientifically designed questionnaire was distributed to the doctors, nurses, and technicians, they were explained about the questions and responses were marked.

**Results:** The results of questionnaire analysis before intervention session show that doctors, nurses, and technicians had least knowledge about the various COVID-19 protocols, that is, 10%, 7.5%, and 5%, respectively. In addition, knowledge about practices regarding COVID-19 protocols at institute level was 32.5%, 27.5%, and 30% in doctors, nurses, and technicians, respectively. Knowledge about fundamentals of COVID-19 was found good in doctors (64%), nurses (41%), and technicians (46%). The results of questionnaire analysis after intervention session show that doctors, nurses, and technicians scores improved significantly in all aspects of knowledge.

**Conclusion:** Knowledge regarding COVID-19 protocols plays a key role in prevention and spread of the disease. Proper intervention through training programs at regular time interval has great influence on various aspect of prevention and spread of the disease. Training programs not only increase knowledge and awareness among health-care professionals but also develops sense of responsibility, which reflects in their attitude and practices.

**Key words:** Analysis, Coronavirus disease 2019 protocols, Intervention, Knowledge, attitude, and practices

## INTRODUCTION

India braces for the coronavirus disease 2019 (COVID-19) pandemic; healthcare workers (HCWs) on the frontlines are particularly vulnerable to this infection. With this mode of transmission, HCWs are among the highest risk of being infected. The highly contagious severe acute respiratory

syndrome coronavirus 2 virus is an additional hazard for the healthcare system apart from the burden of extended work hours, physical and psychological stress, burnout, and fatigue.

HCWs of all levels and groups are involved in caring for patients with this highly transmittable pathogen. COVID-19 has posed serious occupational health risks to HCWs due to their frequent exposure to infected individuals. The literature suggests that lack of knowledge and misunderstandings among HCWs lead to delayed diagnosis, spread of disease, and poor infection control practice. Preventing intra-hospital transmission of this communicable disease is, therefore, a priority. Amidst the current pandemic, the WHO has issued several guidelines,

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**Month of Submission :** 10-2020  
**Month of Peer Review :** 11-2020  
**Month of Acceptance :** 11-2020  
**Month of Publishing :** 12-2020

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and started online courses and training sessions to raise awareness and preparedness regarding prevention and control of COVID-19 among HCWs.

The objective of this study was to assess the awareness of COVID-19 disease and its related infection control practices among health-care professionals in the Indian health-care scenario. This was a questionnaire-based survey adapted from current interim guidelines and information for health-care personnel provided by the US Centers for Disease Control and Prevention and WHO. Therefore, this study was undertaken, as knowledge, attitude, and practice survey is a suitable way to evaluate existing programs and to identify effective strategies for behavioral change in society.

**MATERIALS AND METHODS**

The study was carried on the doctors, staff nurses, technicians, and working in a 750 bedded hospital. A scientifically designed questionnaire was distributed to the doctors, nurses, and technicians in OT and Intensive Care Unit was explained about the questions and responses were marked. Cross-sectional surveys through the questionnaire and discussion were done to assess the knowledge and attitude; the team to assess the practices conducted observational surveys. After noting the responses to the questionnaire, the intervention was made by conducting interactive sessions with audio-visual aids to provide basic knowledge about COVID-19 protocols. After this intervention, a self-assessment test (SAT) was given followed by the session and finally SAT was reviewed.

The questionnaire consisted of questions assessing demographics; information source; knowledge, attitude, and practice toward COVID-19; and perceived barriers to infection control (see online supplementary material). Demographic characteristics included were gender, age, profession and experience, and one item regarding source of information about COVID-19.

The knowledge section had 14 items and each question was answered “yes,” “no” or “I don’t know.” Correct answers scored 1 and incorrect answers scored 0. The attitude section had seven items, and responses were recorded on a five-point Likert scale (1, strongly agree; 2, agree; 3, undecided; 4, disagree; and 5, strongly disagree). The practice section had six items and each item was answered “yes” (1 point), “no” (0 points), or “sometimes” (0 points).

Seven items assessed the perception of HCWs regarding barriers to infection control. Responses were recorded on a five-point Likert scale (strongly agree, agree undecided,

disagree, and strongly disagree). Responses are presented as frequencies and percentages.

**Observation Chart**

The two-tailed *P* value is less than 0.0001.

By conventional criteria, this difference is considered to be extremely statistically significant.

**RESULTS**

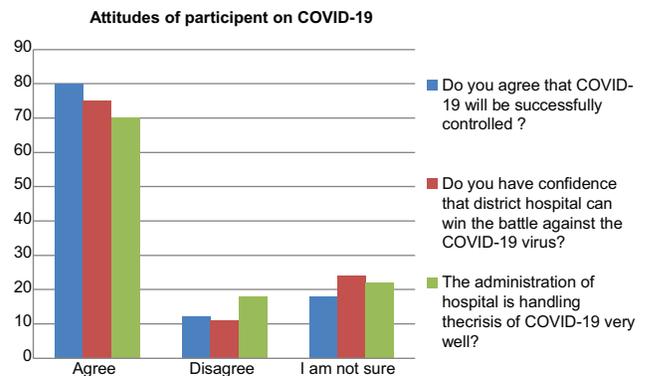
Study conducted with a total of 110 people including 34 doctors, 50 nurses and 26 technicians. The demographic characters in relation to age, gender, and education are shown in Tables 1 and 2. The results of questionnaire analysis before intervention session show that doctors, nurses and technicians had least knowledge about COVID-19 protocols, that is, 10%, 7.5%, and 5%, respectively, as shown in Table 3.

Furthermore, knowledge about practices regarding COVID-19 at institute level was 32.5%, 27.5%, and 30% in doctors, nurses, and technicians, respectively, knowledge about fundamentals of COVID-19 was found good in doctors (64%), nurses (41%), and technicians (46%). The results of questionnaire analysis after intervention session show that doctors, nurses and technicians scores improved significantly in all aspects of knowledge.

The questionnaire analysis of attitude before intervention shows that all the three groups of doctors, nurses, and technicians were in consensus that COVID-19 is new

**Table 1: Distribution of groups**

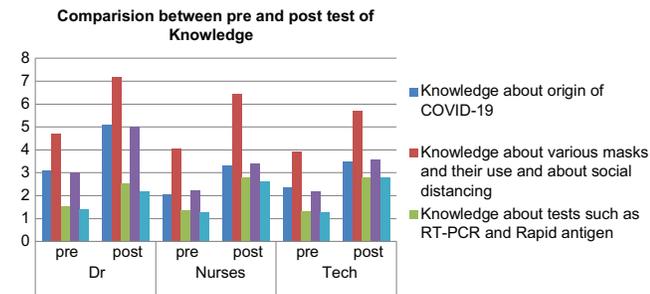
Category	College			Hospital		
	M	F	Total	M	F	Total
Doctors	14	8	22	9	3	12
Nurses	4	28	32	7	11	18
Technicians	17	3	20	5	1	6
Total	35	39	74	21	15	36



to them and they all irrespective of their educational background, need training. There was misconception in all three groups that COVID-19 is responsibility of institute mainly, and subjects of all three groups after training felt that they could create awareness and can deal with the disease better after they are briefed and trained. Majority in three groups, that is, doctors (25), nurses (37), and technicians (17) would like to get some more training on Bio Medical Waste COVID-19. Post-intervention analysis shows that the majority of subjects in all three groups agreed that COVID-19 is an important issue that should be dealt collectively by both individual and institute.

**Table 2: Demographic characteristics**

Variable	Doctors (34)	Nurses (50)	Technicians (26)
Age			
<25.	8	24	13
25–34	16	14	10
34–44	6	8	3
>45	4	4	-
Gender			
Male	23	11	22
Female	11	39	4
Education			
Primary	-	-	-
Secondary	-	-	-
Graduation	9	42	25
Postgraduation	25	8	1



The assessments of practices were mainly done by observing different tasks at defined locations. Observation was made for wearing masks, social distancing, wearing personal protective equipment (PPE) Kit properly, and proper doffing and donning.

Observation reports of practices before intervention session showed that nurses had best score rating of 80 in following COVID-19 protocols, whereas technicians and doctors scored 60 and 30, respectively, on a scale of 0–100. Scores for knowledge about various tests such as real-time polymerase chain reaction and rapid antigen were 20, 60, and 30 in doctor’s nurses and technicians, respectively. Scoring about doffing and donning was 20, 50, and 50 in doctors nurses and technicians, respectively. Doctors performed poorly in the practice of donning and disposal of used PPE kit. After the intervention session observation of practice is done at 29 locations with total duration of 72.5 h. There was improvement in all three categories, that is, doctors nurses and technicians in relation to COVID-19 protocols. Doctors showed maximum improvement after the intervention session.

**Statistical Analysis**

Descriptive and inferential statistics were applied using SPSS Version 21 (IBM Corp.). Chi-squared test, independent sample *t*-test, and one-way analysis of variance were used to compare differences in knowledge, attitude, and practice of HCWs by demographic characteristics. Pearson’s rank correlation test was used to identify any correlation between knowledge, attitude, and practice. A binary logistic regression analysis was applied to identify possible determinants of good knowledge and practice, with results expressed as odds ratio and 95% CI. *P* < 0.05 was considered to indicate significance in all tests. Reliability was calculated using SPSS Version 20 (IBM Corp., Armonk, NY, USA), and Cronbach’s alpha was 0.77.

**Table 3: Comparison between various pre-test and post-test values**

Variables studied	Doctor (n=34)			Nurses (n=50)			Technicians (n=26)		
	Pre-test mean	Post-test mean	P value	Pre-test mean	Post-test mean	P value	Pre-test mean	Post-test mean	P value
Knowledge about origin of coronavirus disease 2019	3.12	5.09	0.0001	2.04	3.32	0.0001	2.38	3.50	0.0001
Knowledge about various masks and their use and about social distancing	4.71	7.18	0.0001	4.06	6.46	0.0001	3.92	5.73	0.0001
Knowledge about tests such as real-time polymerase chain reaction and rapid antigen	1.53	2.56	0.0001	1.36	2.78	0.0001	1.31	2.81	0.0001
Knowledge about personal protective equipment Kit. How to do doffing and donning	3.01	5.02	0.0001	2.26	3.40	0.0001	2.2	3.6	0.0001
Knowledge about rules and regulation	1.4	2.2	0.0001	1.28	2.64	0.0001	1.28	2.78	0.0001

*P* value and statistical significance

## DISCUSSION

A cross-sectional survey from Pakistan was done by Saqlain *et al.* regarding knowledge, attitude, practice, and perceived barriers among health-care professionals regarding COVID-19. It was a multi-centric cross-sectional survey-based study, which was conducted in March 2020 during a period of strict lockdown to implement social distancing to avoid the spread of COVID-19. A questionnaire was designed on Google forms, and a link was shared to WhatsApp groups of HCWs.<sup>[1]</sup>

Similar survey on COVID-19 awareness among health-care students and professionals in Mumbai metropolitan region was done by Modi *et al.* It was a questionnaire-based survey. This is the first Indian study that evaluates the awareness of COVID-19 among health-care students and professionals. In the midst of this crisis, the Indian health ministry has proposed to provisionally permit medical undergraduates of senior grades to treat COVID-19 patients. This move could help plug the shortage of health-care professionals and potentially provide care to a large number of people. Hence, students from various health-care professions were included in our study. This study showed that there is a strong need to implement periodic educational interventions and training programs on infection control practices for COVID-19 across all health-care professions. Conducting periodic webinars for educational intervention for all health-care students and professionals including non-clinical and administrative staff, paramedical, and nursing sub-groups could be a useful and safe tool to create more awareness.<sup>[2]</sup>

Zhou *et al.* did a cross-sectional survey regarding knowledge, attitude, and practice among HCWs in Henan, China. Huynh *et al.* did similar studies. Both the studies analyzed HCWs knowledge, practices, and attitudes regarding COVID-19. In addition to knowledge level, some risk factors including work experience and job category influenced HCWs' attitudes and practice concerning COVID-19. Measures must be taken to protect HCWs from risks linked to job category, work experience, working hours, educational attainment, and frontline HCWs.<sup>[3,4]</sup>

Roy *et al.* did study of knowledge, attitude, anxiety, and perceived mental health-care need in Indian population during COVID-19 pandemic. Novel COVID-19 originating from China has rapidly crossed borders, infecting people throughout the whole world. This phenomenon has led to a massive public reaction; the media has been reporting continuously across borders to keep all informed about the pandemic situation. All these things are creating a lot of concern for people leading to heightened levels of anxiety. Pandemics can lead to heightened levels of stress; anxiety is a common response to any stressful situation.<sup>[5]</sup>

There is moderate awareness related to transmission and symptoms of COVID-19 among educated population in India. There is adequate awareness among public regarding preventive measures for COVID-19 infection. There is a positive attitude of public toward social-distancing, avoiding party and travel and maintaining hygiene. People report anxiety, worries, and paranoia about acquiring infection and sleep disturbances during this pandemic. More the 80% people perceive mental healthcare need to deal with their issues during this COVID-19 pandemic.<sup>[6]</sup>

In various other studies, assessment of knowledge, attitudes, and perception of HCWs regarding COVID-19 was done and it was found that inadequate knowledge and incorrect attitudes among HCWs can directly influence practices and lead to delayed diagnosis, poor infection control practice, and spread of disease. A positive correlation between knowledge and attitude scores was detected. Unavailability of PPE, fear of transmitting the disease to their families, and social stigma were the most frequently reported reasons for increased risk perception. The overall knowledge level of HCWs was generally good especially among physicians. A positive attitude was detected among allied health professionals more than physicians. Risk perception was high among HCWs.<sup>[7,8]</sup>

Elhadi *et al.* did assessment of HCWs levels of preparedness and awareness regarding COVID-19 infection in low-resource settings. This was also similar to our study. A significant number of HCWs expressed low levels of awareness and preparedness regarding COVID-19. This raises a concern regarding the ability of the Libyan health-care system and its HCWs to combat COVID-19 infection. Despite these concerns, along with the poor local health-care infrastructure in Libya, HCWs continue to work during COVID-19, risking their lives to save their patients. Meanwhile, no official courses or training programs are available, and HCWs have to purchase PPE themselves, as they are not provided by the hospitals in adequate amounts.<sup>[9,10]</sup>

This study attempted to assess the knowledge, attitude, anxiety experience, and perceived mental healthcare need among adult Indian population during the COVID-19 pandemic. An online survey was conducted using a semi-structured questionnaire using a non-probability snowball sampling technique. The responders had a moderate level of knowledge about the COVID-19 infection and adequate knowledge about its preventive aspects. The attitude toward COVID-19 showed peoples' willingness to follow government guidelines on quarantine and social distancing. The anxiety levels identified in the study were high. There is a need to intensify the awareness and address the mental health issues of people during this COVID-19 pandemic.

Our study provides considerable insights into the necessity of immediate and determined efforts focused on training programs and providing an adequate supply of PPE to alleviate these challenges during the COVID-19 pandemic.

## CONCLUSION

Our study has illuminated the current level of knowledge and awareness of COVID-19 among doctors, technicians, and nurses, with special consideration for those working in departments responsible for caring for COVID-19 patients. We focused on HCWs who come into direct contact with COVID-19 patients, and are thus expected to have adequate knowledge and preparedness. By contrast, other studies have focused on more general populations of HCWs. This study provides an overview of HCWs preparedness regarding the current pandemic. The respondents had a lower level of preparedness, which highlights the importance of education and training programs for HCWs, to control and prevent infection from COVID-19. However, the absence of an organized and effective governmental plan, along with a poor health-care infrastructure, renders developing countries like India vulnerable. Moreover, educational initiatives, along with more tangible forms of support, such as the provision of PPE, should be carried out to help developing countries improve their abilities to control and prevent COVID-19 infection.

### What this Study Add to Existing Knowledge

The situation demanded urgent development of strategies to prevent infection among high-risk populations including pre-exposure and post-exposure prophylaxis. This study showed that there is a strong need to implement periodic educational interventions and training programs on infection control practices for COVID-19 across all health-care professions. Conducting periodic webinars for educational intervention for all health-care students and professionals including non-clinical and administrative staff, paramedical, and nursing sub-groups could be a useful and safe tool to create more awareness.

### Limitation

Sampling for the study was conducted through a convenience, sample through the networks of the researchers and disseminated through different social media platforms (WhatsApp, Facebook, Twitter, etc.). As a result, there is a possibility of *bias* as underprivileged populations may not have been able to participate in the study. In

addition, when compared to current population statistics in hospital, the sample of the study was over-representative of women, people below the age of 50, and those employed in the public sector. Therefore, there are limitations to the representativeness of the findings. A more systematic, inclusive sampling method was warranted to improve representativeness and generalizability of the findings. A further limitation of the present study is the possibility of participants giving socially desirable responses. As this study used self-reported data, it is possible that participants will have answered attitude and practice questions positively based on what they perceive to be expected of them.

## CONTRIBUTION BY DIFFERENT AUTHORS

- First, author corresponding author concept and motivator to data collection.
- Second author: Data assessment and treatment.
- Third author: Data collection, compilation, and statistical analysis.

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**How to cite this article:** Khare S, Dangi V, Sharma S. Knowledge, Attitude and Practices Regarding Coronavirus Disease 2019 Protocols amongst Doctor's Nurses, Technicians at District Hospital Vidisha – A Pre- and Post-Intervention Analysis. *Int J Sci Stud* 2020;8(9):18-22.

**Source of Support:** Nil, **Conflicts of Interest:** None declared.