BEHAVIORAL INSIGHT FOR COVID-19 AMONG STAFFS OF A TEACHING HOSPITAL IN KUMAUN REGION, UTTARAKHAND

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ABSTRACT

Introduction: COVID-19 is caused by a novel virus and is known to be an infectious respiratory disease affecting more than 200 countries and union territories of the world**.** 80% of the patients are shown to have mild to moderate disease. Illness prevention is the mainstay of getting away from the condition with the non-availability of vaccines or medicine. **Methods:** The aim & objective of this study is to describe the behavioral insight (knowledge, attitude & practice) regarding preventive measures of COVID-19 among the teaching hospital staff. An institutional-based descriptive study was conducted among 168 staff, including lab technicians, doctors, staff nurses, and other supporting staff of a tertiary hospital using a convenient sampling technique. The data were obtained by interviewing staff with a pre-tested semi-structured schedule. **Result:** The study results showed that most of the respondents were found to have good knowledge, attitude, and practice towards preventive measures such as social distancing, hand hygiene, face mask, and PPE Kit. 88% of participants were using 3 layered medical masks, and most of them (63%) were using a regular wash of face mask. Among most respondents, no gap between knowledge and practice was seen; however, proper use, handling, and disposal of face masks and other PPE was a concern. **Conclusion:** Therefore, there is a need to improve the knowledge of COVID-19 among healthcare workers, which is possible with the availability of good quality Information Education and Communication (IEC) materials.

Keywords: Behavioral insight, COVID-19, Social Distancing, Face mask, Hand Hygiene, PPE

INTRODUCTION

The Coronavirus Disease 2019 (COVID-19) is an infectious respiratory disease that originated in Wuhan, China, in December of 2019, caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) (World Health Organization (WHO), 2020a). Some common signs and symptoms of the disease include fever, dry cough, fatigue, sputum production, shortness of breath, and myalgia or arthralgia (Ministry of Health and Family Welfare, 2020b; World Health Organization (WHO), 2020c). It is reported that 80% of the patients have had mild to moderate disease, and about 14% have severe disease. The route of transmission of the virus is via droplets and fomites when coming in contact between an infector and infected (World Health Organization (WHO), 2020c)

WHO declared the disease a pandemic on the 11th March 2020 (World Health Organization (WHO), 2020a). The pandemic has had a significant impact on the lives of Indians at large. The first case of COVID-19 in India was detected on the 30th January 2020 (Mukesh Rawat, 2020), and the first COVID-19 related death on the 12th March 2020 (Hindustan Times, 2020), which has escalated up to 1,01,139 confirmed cases and 3,163 deaths as of 19th May 2020 (Ministry of Health and Family Welfare, 2020d). Educational institutes were closed down, and classes were conducted online amidst the coronavirus pandemic. Tertiary care hospitals were converted into a dedicated COVID-19 hospital to tackle the rising cases

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of positive cases and those suspected to have come into contact or have visited the hotspot of coronavirus.

To contain the pandemic, India announced a pan-India lockdown on 22nd March 2020 for 21 days to prevent the social gathering, which will allow people to maintain social/personal distancing (United Nations News, 2020). The lockdown exempted essential services like medical, drug stores, primary commodities, postal and public work departments. Even as the economy crumbled owing to the lockdown, the government and various Non-Governmental Organizations, Individuals, etc., came forward with efforts to make available essential commodities for the people who were stranded due to nationwide lockdown. The government sprang into action against the rising prices of necessary items and placed a cap over the costs for these items.

Taking note of the positive effect of lockdown, the government extended the lockdown for 68 days in 4 successive phases to further flatten the epidemic curve (Utpal Bhaskar, 2020; Economic Times (ET) Online, 2020; The Hindu Net Desk, 2020).

Due to no vaccine or medicine against the virus to date, the only way to get around the disease is to administer "social vaccine," which comprises ‘social or personal distancing and lockdown.' It is followed by (Press Trust of India Ltd., 2020) wearing of face mask, hand hygiene, minimizing the movement of people, avoiding social gatherings, coughing etiquette. The messages have been given to the public against the disease. Every individual has to have the proper knowledge, a positive attitude, and good practice of what they know to ensure the win against the virus.

The virus is known to spread easily via droplets. Therefore, the government had made it mandatory for everyone to wear a face mask, so the people must know which type of mask to wear and how to use it (Ministry of Health and Family Welfare, 2020a). Similarly, it is crucial to have the correct knowledge of hand hygiene, including how and when to perform and the duration. For those working near the positive cases in the hospital, it is mandatory to have proper knowledge about the appropriate use of Personal Protective Equipment (PPE) regarding donning and doffing and its disposal (Ministry of Health and Family Welfare, 2020c).

The hospital staff, being the ones with a high risk of coming in contact with patients infected with the virus, their insight and practice regarding prevention of the disease is an integral part against COVID-19. Therefore, this study aimed to describe the behavioral insight (knowledge, attitude & practice) regarding preventive measures of COVID-19 among teaching hospital staff.

METHODS

The study was an institution-based descriptive cross-sectional study conducted in Government Medical College and associated Dr. Sushila Tiwari hospital (STH) with assessing the behavior, knowledge, and practice regarding COVID-19 among the staff of Government Medical College and associated hospital.

This hospital was in Haldwani City of Uttarakhand state, India. STH hospital was the referral hospital of Kumaun Region and a designated COVID-19 hospital**.** The participants for this study were staff of Government Medical College and associated Hospital (STH) (including medical officers, nurses, midwives, pharmacists, laboratory and other hospital technicians, attendants, cleaners, security guards, and other helping staff).

All staff of Government Medical College and associated hospitals (STH) who were available during data collection and interested in participating in the study were included. Staff who were not interested or did

not give consent for participating were excluded.

A total of 168 participants were included by using the convenient sampling technique. After explaining the study's purpose and goal, written informed consent was taken from the participants before the data collection. This study maintained the anonymity and confidentiality of the study participant.

A face-to-face interview was conducted using a pre-tested semi-structured schedule designed to obtain data from participants regarding sociodemographic profile and behavior during COVID-19. It compromised social distancing, using personal protective equipment (PPE) kits, face mask, and hand hygiene. The schedule was made using the web application at five.epicollect.net, where the data collection was done using the android application of the same. The data was collected from different wards, emergency departments, laboratories, outpatient departments, operation rooms, pediatrics, injection and dressing rooms, radiology and radiotherapy, and other hospital departments on the study. Data were analyzed using SPSS software version 16, and the result was presented in the form of frequency tables and percentages.

We looked into their knowledge, attitude, and practice for COVID-19 and showed the behavioral aspect of study participants regarding COVID-19 included the following:

Knowledge was defined as having an adequate understanding of handwashing, social distancing, rational use, and disposal of personal protective equipment. **Whereas attitude** was the behavior developed through cumulative experience regarding COVID-19, and **practice** was defined as an act of performing given procedure(s) according to a set standard. Good practice: Staff who correctly responded ≥50% to the practice questions regarding hand washing, social distancing, rational use, and disposal of various personal protective equipment. Poor practice: study participants who were unable to respond ≥50% to the practice questions regarding hand washing, social distancing, rational use, and disposal of personal protective equipment. This research has passed the ethical assessment from the Institutional Ethics Committee (IEC) of Govt. Medical College, Haldwani, India vides letter no. 565/GMC/IEC/2020/Reg. No.522/IEC/R-12-08-2020 dated 19th October 2020.

RESULT

The total number of participants included in the study was 168, out of which 45.8% were male, and 54.2% were female. The maximum participants were from Nainital (96.4%), and the remaining were from the district Udham Singh Nagar. It was found that most of the participants belong to a nuclear family (76.6%). Less than a quarter of the participants were living in a joint family. The educational status of the participants revealed that 44.3% were graduates and above, 23.4% had their schooling till intermediate, and 21% were professionals and that below high school level of education was seen among 11.4% of the subjects. The various occupations of the individuals are as follows: 29.8% were nursing staff, 16.1% were doctors, 7.1% lab tech, and 47% were other staff of various capacities (attendants, sweeper, storekeepers, guards, ambulance drivers, pharmacist, receptionist, clerk/office staff). [Table 1]

All the participants understood that ‘social distancing’ meant ‘maintaining a distance of at least 1 meter’, 92% had proper knowledge about steps of appropriate hand hygiene. The appropriate method of wearing a face mask and its adequate disposal was known to 96% and 90% of the participants. Coming to the Personal Protective

Equipment, 73% of them knew the appropriate method of donning and doffing of PPEs and correct methods of disposal of PPEs. The participants' overall knowledge was good for the various parameters considered. They also found this knowledge to be the practical way to prevent the disease at large. The knowledge about the different types of face masks available was varied and ranged from 21% to over 90%. The face masks they know of and have used include Cloth masks, 3-layer medical masks, N95 masks, and FFP2 masks, respectively, 70%, 96%, 83%, and 21%. [Table 2]

Table 3 depicted the participants' attitude, which on the overall view, was seen to be 'positive.' All the participants have a positive attitude towards prevention of COVID-19 by practicing social distancing when in the public space, performing proper hand hygiene, and wearing face masks whenever they were. A similar positive response was also obtained regarding wearing PPE against COVID-19 among 93% of the individuals. On the other hand, 63% thought that face masks could be reused by washing them after every use.

All the participants (100%) reported practicing social distancing when in the market by maintaining a safe distance of a minimum of 1 meter between themselves and the others. Almost all the participants (96%) also reported performing proper hand hygiene while at work and off work. It was found that 92% of the study subject used both alcohol hand rub and soap and water. 66.7% reported using liquid soap among those who used soap and water. Although the majority practiced hand hygiene (96%), over half of them (56%) were seen to perform the procedure properly by maintaining more than 20 seconds for proper hand hygiene. Most of the study participants (92.8%) wash their hands after touching items in public places, before touching eyes, nose, and mouth, after sneezing or coughing, before and after the meal, after using the toilet, before preparing the meal. [Table 4]

From among the different types of face masks, the participants wore a 3-layered medical mask (88%), N95 mask (72%), cloth mask (40%), and FFP2 mask (6.5%), which most of them obtained from hospital supply (90%), 53% bought it from stores/vendors, 5.4% made the mask themselves at home, and 4% bought it online. More than half (63%) of the participants reported washing the mask to reuse them. Of the 63% who passed the mask, 41% washed 1-3 times, and 22% washed the mask more than 3 times before discarding. More than half of them used detergent to wash the mask, a quarter of them used plain water, 18% used disinfectant, and 2% used alcohol. More than half (60%) disposed of the mask inside the yellow biomedical waste bin, 34% tossed it inside normal waste bins, and a mere 2% burned the mask at home. Proper disposal of the doffed PPE is important for the staff in the hospital to prevent the spread of the disease, and it was found that 73% of the participants disposed of the used PPE in the yellow bin. [Table 4]

Table 1. Demographic profile of the participants

Characteristics	Responses	Frequency	Percentage
Sex	Male	77	45.8
	Female	91	54.2
Present address (district)	Nainital	163	96.4
	Udham Singh Nagar	5	3.0
Type of family	Nuclear	129	76.6

Characteristics	Responses	Frequency	Percentage
	Joint family	39	23.4
Education	Primary school	2	1.2
	Middle school	3	1.8
	High school	14	8.4
	Intermediate	39	23.4
	Graduation and above	75	44.3
	Professional	35	21.0
Occupations	Lab technician	12	7.1
	Doctor	27	16.1
	Staff nurse	50	29.8
	Others	79	47

Table 2. Knowledge of the participants

Characteristics	Responses	Frequency	Percentage
What do you understand by 'social distancing'?	Maintaining at least a 1-meter distance	168	100
Do you know the steps for proper hand hygiene?	Yes	155	92
What are the types of hand hygiene	Alcohol hand rub	2	1.2
	Water and soap wash	11	6.5
	Both	155	92.3
Do you know the proper method of wearing a face mask?	Yes	162	96
What are the types of face masks you know about?	Cloth mask	117	70
	3-layered medical mask	162	96
	N95 mask	140	83
	FFP2 mask	35	21
Do you know how to dispose face mask properly?	Yes	151	90
Do you know the proper method of donning and doffing PPE?	Yes	125	73
Do you know where to discard the used/soiled PPE?	Yes	125	73

Table 3: Attitude of the participants

Characteristics	Responses	Frequency	Percentage
Do you think maintaining 'social distancing' is an effective way of preventing COVID-19	Yes	168	100
Do you think performing proper hand hygiene is an effective way of preventing COVID-19	Yes	168	100

Characteristics	Responses	Frequency	Percentage
Is wearing a face mask an effective measure to prevent COVID-19	Yes	168	100
Do you agree with the washing of masks to reuse them?	Yes	106	63
Do you think wearing PPE is an effective measure to prevent COVID-19	Yes	163	93

Table 4. Practices of the participants

Characteristics	Responses	Frequency	Percentage
Do you practice social distancing when you are in the marketplace	Yes	168	100
Do you perform proper hand hygiene?	Yes	162	96
What are the types of hand hygiene you practice?	Alcohol hand rub	2	1.2
	Water and soap wash	11	6.5
	Both	155	92.3
What type of soap do you use for hand washing?	Liquid soap	112	66.7
	Bar soap	56	33.3
How long do you perform hand hygiene?	>20 sec	95	56
How often do you perform hand hygiene?	After touching items, before touching eye, nose, and mouth, after sneezing or coughing, before and after the meal, after using the toilet, before preparing the meal	156	92.8
What type of mask are you using?	Cloth mask	67	40
	3-layered medical mask	148	88
	N95 mask	121	72
	FFP2 mask	11	6.5
Do you wash your facemask?	Yes	106	63
What do you use to wash the mask? (n = 106)	Detergent	57	53.8
	Water	27	25.5
	Disinfectant	20	18.9
	Alcohol	2	1.8
How many times do you wash before discarding the mask	1-3 times	69	41
	>3 times	37	22
Where do you discard disposable face masks?	Yellow BMW Bin	101	60
	Waste bin	58	34.5
	Burn	4	2.5
From where do you procure face masks?	Hospital supply	152	90.5
	Stores/vendors	89	53
	Home-made	9	5.4

Characteristics	Responses	Frequency	Percentage
	Online	7	4.2
Where do you dispose of used/soiled PPE?	Yellow bin	125	73

DISCUSSION

Our study in Uttarakhand observed the behavior regarding COVID-19 among medical personnel that included doctors, staff nurses, lab technicians, ward attendants, pharmacists, and others during the COVID-19 pandemic. A flood of true and untrue information regarding COVID-19 was seen spreading during the pandemic via social media, news channels, newspapers, government websites, and various other Information Education and Communication (IEC) materials. These may lead to changes in perception on how people look at COVID-19 and may indirectly affect individuals' behavior towards COVID-19 infection. This information is a double-edged sword. It may help individuals accept the preventive measures laid down by the scientific committee for them and their families. It may have a devastating effect due to the wrong information they would have assimilated.

In our study, most of the participants were from the Nainital district, and gender distribution among the participants was more or less the same. We found that the participants had adequate knowledge regarding social distancing, i.e., maintaining at least 1 (one) meter distance from another person, use of face mask which are the recommendations made by the *World Health Organization (WHO* (World Health Organization (WHO), 2020b)*)* are seen to be one of the effective ways known to prevent the transmission of COVID-19 infection (Bahl et al., 2020; Chu et al., 2020; Ueki et al., 2020)

Knowledge regarding steps of proper handwashing was found among 92% of the students. It was found to be similar to a study conducted by *Wong T W et al.* (Wong and Tam, 2005) among Hong Kong's medical students after the SARS epidemic. Another similar to our study conducted by Paudel IS et al. (2016) (Paudel, Ghosh and Adhikari, 2017) on nursing students regarding hand hygiene in the Western region of Nepal shows that around 84% of participants know about hand hygiene. At the same time, knowledge regarding the minimum time needed for alcohol-based hand rub (20 sec) was known correctly by only 24 % of the participants. Another study conducted by Goyal A et al. (Goyal A et al. 2020) on health care workers in a Tertiary care center in Uttarakhand found a similar result, i.e.,71.6% of participants have good knowledge regarding hand hygiene. Comparatively lesser prevalence was seen in a study from Karnataka, India (*Nair S. S. et al*.) (Nair et al., 2014), where the proper knowledge on hand hygiene among study participants was 74%. Another study conducted by Satyajeet K. Pawar et al. (2018) (Pawar et al., 2018) found the lesser prevalence of only 62 % among nursing staff in Western India. A study conducted in Nigeria in 2018 also showed insufficient knowledge regarding handwashing (53.8%) among health care workers. A much lesser prevalence of knowledge among the Interns (House Officers) and Post Graduate trainee physicians of a tertiary care teaching hospital was found in Anwar MA et al. (2009), which is only 17%. Still, the overall compliance was found to be 38.8% though it mainly depends on the procedure performed on a particular patient. We also found that maximum of the staff was aware of handwashing techniques ('soap and water' and 'alcohol contain hand rub'). It was similar to the survey conducted by *Wong T W et al.* (Wong and Tam, 2005), also in a study conducted by Deepak, *et al.*

(2020) shows that 84% of the staff knew about the importance of handwashing with antiseptic soap and Almost every staff member (99%) were aware of 7 steps of handwashing. Maximum participants (96%) have heard about 3 layered medical face masks, while 83% and 21% have listened to about N-95 and FFP2 masks, respectively. Our study recorded 96% of our participants had the proper knowledge of wearing the face mask method. In contrast, a study conducted in 2020 by Tadesse et al. (2020) in Ethiopia showed that health providers' knowledge towards proper face mask utilization was only (33.5%). *Modi, P D, et al.* (Modi et al., 2020) found the prevalence lower at 45.4%. *Kumar et al.* (2020) found a similar lesser majority of around 43.6% of participants knew the correct method of wearing the masks. Only 68.9% knew that there are three layers, 53% said that the middle layer act as a filter media barrier and about 75.5% had previous knowledge about the recommended maximum duration of wearing it.

The attitude of all our participants on how effective the various preventive measures (social distancing, hand hygiene, and facemask) are and their willingness to apply practically to fight against the disease was found to be positive (100%) in our study. We also found that 63% agree with washing face masks to reuse them. This became an issue due to the inadequate availability of facemask in the stores (both offline and online). It happened during the early stages of complete lockdown. Even if masks were available, it was sold for exorbitant prices. However, in a study conducted by *Al-Hazmi, A et al*. (Al-Hazmi et al., 2018), *Nair S. S. et* (Nair et al., 2014) *al* only about half of their participants were reported to show a positive attitude towards the same.

Similarly, Paudel IS et al. (2016) (Paudel, Ghosh, and Adhikari, 2017) show that about 90%of the participants had a positive attitude towards hand hygiene. *Kumar et al.* (2020) found only 64.7% of participants obtained a moderate-to-poor score regarding the correct usage of a surgical face mask that is also supposed to be less. Similar to our study Deepak, et al. (Deepak, et al. 2020), *86 % of* the staff had a positive response

The entire study participants practiced social distancing when in the market place and the maximum of them (96%) was seen to perform proper hand hygiene. Hence our study showed no gap between knowledge and practice regarding social distancing and hand hygiene. Thus, these findings were much more satisfactory than the study conducted in South Korea regarding Middle East Respiratory Syndrome (MERS) by *Kim, J S et al.* (Kim and Choi, 2016), which showed only 54.7% of students maintained social distancing and 85.5% were reported to practice handwashing.

We have found that 92% of our participants wash their hands with soap and water. They also used alcohol-based hand rub, which is slightly higher (84.7%) than the study by *Wong T W et al.* (Wong and Tam, 2005), but regarding the use of surgical mask, the similarity was seen between the present study and *Wong T W et al.* (Wong and Tam, 2005). In contrast, Paudel IS et al. (2016) (Paudel, Ghosh, and Adhikari, 2017) showed that only 56% of the participants exhibited good practice regarding hand hygiene. Another study by *Satyajeet K. Pawar et al. (* 2018*)* (Pawar et al., 2018) found 46 %, 22 out of 48 participants, had an average grade score in ideal practicing of hand hygiene that is also less than our study. Another study conducted in Ethiopia in 2020 by *Tadesse et al*. showed that only 45.3% of health workers have a positive attitude regarding facemask use, and only 33.3% were in good practice of the same. Another study by Kumar J et al. (2020) conducted on health care workers found that 56.4% knew the correct way of wearing a surgical mask, 68.9% knew that there are three layers in a surgical mask.

The use of the N-95 mask was extremely high in our study (72%), unlike the

study from Hong Kong[3] (0.8%). This difference may be due to the different perceptions of participants regarding COVID-19 and SARS. Among 63% of participants who favored washing face masks, 53.8% used detergent, 25% washed with plain water, and about 19% used disinfectant over their masks. This behavior may be due to participants' perception that washing may remove possible viruses from the mask. Our study also showed that our study participants' knowledge regarding proper disposal of masks and PPE was inadequate, and similar findings were observed by *Kapoor, D et al*. (Kapoor et al., 2014).

CONCLUSION

The huge epidemic of infodemic was seen everywhere, with varying contents such as; how COVID-19 spreads, how to be safe from COVID-19, treatment for COVID-19, etc. Participants of this study were hospital staff, which showed no gap in their knowledge and practice regarding the prevention of COVID-19. The pandemic has opened up the area of deficit in our health system, especially manufacturing and procurement of essential items like surgical masks, N95, sanitizers, etc. This has to be taken as a wake-up call for us on what we can do and how we can prepare for any future outbreak of disease(s). Another area of concern was the Proper disposal of used facemasks as it may contaminate the environment and increase the risk of disease transmission.

We recommend that proper knowledge be imparted to every citizen by using suitable measures in the form of IEC. Besides that, the legislation should exist along with a routine update of knowledge for health workers to increase their knowledge and the community so that people view the different preventive measures positively, which will help change their behavior towards the pandemic.

The major limitation of the present study is that the findings may not be generalizable as the study participants were employees of a teaching hospital. Secondly, the temporality of the findings cannot be ascertained as it was a cross-sectional study.

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