



Original Research Article

Knowledge and practice of masks during COVID-19 among non-teaching staff in a tertiary health care Centre, India

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ABSTRACT

Introduction : The novel coronavirus (COVID-19) pandemic has infected millions worldwide. Preventive interventions are beneficial to mitigate transmission, containment of the disease, and stop the resurgence of another wave of the pandemic.

Materials and Methods: A cross-sectional study was done among non-teaching staff, aged 18 years or above willing to voluntarily participate to assess knowledge and practice of face masks during the COVID-19 pandemic in a tertiary health care center. We also addressed the need for the use of face masks even after the vaccination is done.

Results: Subjects demonstrated good knowledge about transmission and practice of preventive measures for COVID-19. Among those, who were always (100%) using masks, marital status, education, and occupation had a significant association with the frequency of use of masks. While those, who were mostly (>50%) using masks, marital status, and education were significant determinants of the frequency of use of masks.

Conclusions: The study highlighted the importance of knowledge and appropriate practice of the use of masks, which can help policymakers to predict success & make necessary modifications based on it, to stop transmission and fluctuation in the declining phase of covid-19 pandemic.

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1. Introduction

In December 2019, cases of pneumonia of unknown origin were reported in Wuhan, a city in China. It was later discovered that it was caused by a novel coronavirus named SARS-CoV-2 and the disease caused by it was called COVID-19, which led to unprecedented and unforeseen challenges. This required collective action and the support of all stakeholders.¹⁻⁴ To reduce the burden of infection, many countries have taken steps to reduce person-to-person exposure by advocating certain personal behaviors (COVID-appropriate behavior) such as social distancing, use of face masks, self-isolation, frequent

hand washing, and disinfection of surfaces.^{4,5} While all necessary measures to fight the spread of COVID-19 are being effectively spearheaded by governments, there is a need to reinforce the importance of preventive measures and practices in a sustained manner to combat and control the disease in the long run. India has managed to tame the new cases of COVID-19, continuing with a downward trend, with the coverage of total vaccination of more than two billion according to the Ministry of Health and Family Welfare (MoHFW), India.⁴⁻⁷ Coronaviruses mainly target the respiratory tract. Contamination of the mucous membranes of the mouth and nose by infectious droplets/aerosols or from a contaminated hand also allows the virus to enter the host. Therefore droplets/airborne

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precautions using masks are important when handling a suspected or confirmed case of COVID-19/performing aerosol-generating procedures.^{1–3} There are different types of masks available. The type of mask used is related to the category of personnel and the particular risk profile of their work. Two types of masks are recommended for different categories of personnel working in a hospital or community setting depending on the working environment: 1. Triple Layer Medical Mask- disposable, fluid resistant mask; provides protection against droplets of infectious material, 2. N-95 masks with high filtration efficiency, provide the necessary air seal and are designed to fit very close to the face.^{8–11} Masks can play two roles in the prevention of viral transmission. First, masks can affect respiratory pathogen emissions resulting from turbulent gas cloud formation and coughing or sneezing. Second, the mask can filter out viral particles such as aerosols or droplets. Additionally, for asymptomatic infected individuals, wearing a mask can potentially reduce the risk of infecting other people.¹² Masks are a simple and low-cost, non-pharmaceutical individual intervention to protect themselves and prevent the spread of respiratory infections, thereby effectively improving public health outcomes. Health organizations around the world recommend the use of face masks or face coverings to prevent widespread infection caused by COVID-19, in public settings and when people are not in their homes, especially when other social-distancing measures are difficult to practice.^{11–14} There has been limited international consensus on the type of face mask among the general public. Most health agencies have proposed their guidelines for the use of masks, types of masks, proper use, storage, and cleaning or disposal to ensure that they are as effective as possible and necessary to avoid increased transmission risk.^{15–17} A confused understanding and pessimistic attitude toward an emerging infectious disease can create unnecessary anxiety and chaos that could exacerbate the pandemic. Monitoring public perception in disease control epidemics enhances compliance for the community with precautionary and preventive strategies. Monitoring and analyzing public response helps decision-makers and policymakers to take appropriate measures to promote individual/community health.^{15–18} To guarantee ultimate success, people must follow COVID-appropriate behavior, which is largely influenced by their knowledge, attitude, and practices toward the disease.¹⁹ Studying the knowledge, attitudes, and practices of the general population concerning the COVID-19 pandemic can certainly help in understanding the practical implementation of various preventive measures and awareness supported by the government and also help in providing future insights in those areas, that need more emphasis. With these considerations in mind, we attempted to assess the knowledge and practice of using masks during the COVID-19 pandemic and related factors among non-

teaching staff.

2. Materials and Methods

This cross-sectional study was conducted among all non-teaching staff (clerks, administrative assistants, laboratory technicians, management staff, nurses, sweepers, electricians, carpenters, attendants, etc.) of a tertiary health center located in Uttar Pradesh, India. Subjects who were over 18 years of age and willing to participate voluntarily were included in the study. Those who were reluctant, non-responders, and absent on the day of the interview were excluded. After obtaining verbal consent regarding voluntary participation, data were collected using a pre-designed, semi-structured, interviewer-administered questionnaire based on updated COVID-19 information provided by various health agencies.

2.1. Study variables: Independent variables

Socio-demographic characteristics (including name, age, gender, educational status, occupation, marital status, and type of family).

2.2. Dependent variables

Knowledge regarding COVID-19 disease characteristics, transmission routes and protective measures and practice about protective measures and use and proper disposal of mask. Data collection was performed by Epi-Collect 5 (Data Capture Tool), then Microsoft Excel sheets were extracted and validated. Data were checked for consistency and completeness before admission. A clean database was generated and analyzed in SPSS-20.0. The distribution of the study population according to their socio-demographic profile was presented by frequency and percentage (%) tables. Multinomial regression was performed to identify independent variables that predicted significant association with dependent variables.

Ethical approval was obtained from the Institutional Ethics Committee (Reference No. IEC/RMC/est./Dean/2021/12033). Subjects were explained the nature of the study and verbal consent was obtained from them. The confidentiality of the information provided was maintained. Subjects were provided with health education and adequate counseling

3. Results

All of the subjects were aware of the transmission of coronavirus through respiratory droplets (sneeze or cough) if they come in contact with a COVID-19-positive person, and the usefulness of preventive measures and face masks for preventing coronavirus infection. 380 (82.6%) of subjects were younger than 35 years with a mean age of

Table 1: Knowledge of Corona virus disease and Face mask use

Variable		Frequency (%)
Type of Facemask used*	Triple layer Surgical Mask	422 (91.7%)
	N-95 Mask	289 (62.8)
	Handkerchief	75 (16.3)
	Cloth material	216 (47.0)
	Always (100% of the time)	279 (60.7)
Pattern/ frequency of Face mask use	Mostly (>50% of the time)	150 (32.6)
	Often (≤50% of the time)	27 (5.9)
	Less Often (< 50% of the time)	4 (0.9)
	Yes	418 (90.9)
Should a person without sign and symptom of COVID-19 wear mask?	No	7 (1.5)
	Can't say	21 (4.6)
	May be	14 (3.0)
Preference to use a homemade mask in absence of a commercial mask	Yes	361 (78.5%)
	No	10 (2.2%)
	Can't say	6 (1.3%)
	May be	83 (18%)
Will use facemask along with social distancing for better protection?	Yes	450 (97.8%)
	No	0 (0%)
	Can't say	2 (0.4%)
	May be	8 (1.7%)
Those vaccinated with COVID-19 Vaccine, also have to wear face mask	Yes	376 (81.7%)
	No	18 (3.9%)
	Can't say	20 (4.3%)
	May be	46 (10.0%)
Considers facemask to be necessary for next few months	Yes	232 (50.4%)
	No	13 (2.8%)
	Can't say	110 (23.9%)
	May be	105 (22.8%)
Considers Face mask to be disposed carefully to prevent virus transmission	Yes	447 (97.2%)
	No	0 (0%)
	Can't say	5 (1.1%)
	May be	8 (1.7%)

*multiple answer

28.61±8.24 years. Most of the participants were male (232; 50.4%), Hindu (437; 95%), educated graduates and above (358; 77.8%), and belonged to the nursing profession (211; 45.9%).

As we can depict from Table 1; 422 (91.7%) were using disposable surgical face masks, (289; 62.8%) N-95 masks, (216; 47.0%) simple cloth masks, and (75; 16.3%) handkerchiefs on their face. 279 (60.7%) subjects were always wearing the mask, while (150; 32.6%) were wearing it mostly (>50% of the time). 418 (90.9%) subjects agreed upon wearing a mask even if a person was without signs and symptoms of COVID-19. 361 (78.5%) preferred to use a homemade mask in the absence of a commercial mask. 450 (97.8%) agreed that using facemasks along with social distancing provides better protection. 376 (81.7%) agreed to wear a face mask after vaccination for COVID-19. 232 (50.4%) said that a face mask is necessary for the next few months. 447 (97.2%) people consider that face masks should be disposed of carefully to prevent virus transmission.

Multi-nominal regression analysis showed that significant chi-square (χ^2) statistics ($\chi^2=93.15$; $p<0.05$) and non-significant Pearson and Deviance statistics ($p>0.05$) proved to have a significant relationship between the independent and dependent variables in the final fit model. The model accounts for 11.9% to 22.9% of variance and represents a decent-sized effect. Marital status, educational status, and occupation contributed significantly to the model. As we can see from Table 2, among those, who were always (100%) using masks, marital status, education, and occupation had a significant association with the frequency of use of masks. While those who were mostly (>50%) using masks, marital status, and education were significant determinants of the frequency of use of masks. Males were 31% and 12.7% more likely to use masks always and mostly than females as shown by adjusted estimates respectively. Nurses belonging to both categories (always (100%) and mostly (>50%) mask users) are 12.38 and 4.34 times more likely to use masks respectively.

Table 2: Multinomial logistic regression analysis for association of socio-demographic variables and frequency of use of mask (n=460)

Socio-demographic Variables	N, %	Frequency of use of mask			
		“Always (100%)” Vs “(<50%)*”		“Mostly (>50%)” Vs “(<50%)*”	
		P value	aOR (95% CI)	P value	aOR (95% CI)
Age					
≤35 years	380 (82.6%)	0.812	0.89(0.358-2.235)	0.896	1.063(0.426-2.652)
>35 years	80 (17.4%)		1		1
Sex					
Male	232 (50.4%)	0.550	1.31(0.541-3.174)	0.790	1.127(0.467-2.718)
Female	228 (49.6%)		1		1
Marital status					
Married	200 (43.5%)	0.023#	0.194(0.047-0.795)	0.013#	0.166(0.04-0.686)
Unmarried	260 (56.5%)		1		1
Educational status					
Up to Intermediate	102 (22.2%)	0.000#	0.158(0.060-0.418)	0.015#	0.298(0.11-0.788)
Graduate and above	358 (77.8%)		1		1
Occupation					
Nurse	211 (45.9%)	0.026#	12.38(1.345-113.93)	0.199	4.335(0.46-40.667)
Other	249 (54.1%)		1		1
Family					
Living with family	311 (67.6%)	0.259	2.161(0.566- 8.25)	0.218	2.335(0.605- 9.01)
Living alone	149 (32.4%)		1		1

p<0.05-Significant, CI- Confidence interval, aOR- Adjusted odds ratio

4. Discussion

This study addresses a major preventive aspect of the COVID-19 disease. The awareness campaigns run by health agencies provided effective health education to various communities around the world which has affected people's perceptions.

All participants in the current study were well aware that the disease is contagious and can become infected when a person comes into close contact with or touches a COVID-19 patient (through respiratory droplets, sneezes, or coughs). Most subjects presented positive attitudes and practices in terms of wearing face masks, maintaining social distancing, and personal safety. Various KAP studies related to COVID-19 also pointed out that knowledge about COVID-19 and the practice of preventive measures was significantly influenced by various socio-demographic variables i.e. age, gender, education level, residence, income groups marital status, etc.^{2,18–26}

Islam et al. reported that knowledge was positively associated with males, having a secondary level of education and being unmarried. More frequent COVID-appropriate practices were positively associated with a comparatively higher level of education, being unmarried, and having a higher income while gender, occupation, type of family, and use of masks were not significant.²

Nazli et al. reported that 93.8% of respondents knew that COVID-19 was contagious, 76% were using masks, 36.4% of them were using disposable surgical face masks, 31.6% were using N-95 respirators, 19.9% were using simple

cloth masks and 12.1% were using black anti-smoking face masks. 79.6% of the respondents knew that face masks are useful to prevent coronavirus infection.³ Knotek et al found that most people wore masks in indoor public spaces, even when not required. Masks were seen as helpful, but some felt less inclined to follow social distancing guidelines when wearing them. Older people were more likely to wear masks than younger individuals.¹³

Tomar et al. said that 90.7% of men and 97.1% of women claimed to have taken adequate protective measures while stepping out of the house. Male, urban population, higher education, and higher occupation were significantly associated with higher knowledge scores.¹⁹ Maude et al. reported a high level of knowledge (over 80%) regarding the main transmission routes, common symptoms, and recommended prevention methods. However, there was less awareness about aerosols, food and drink, and pets as potential sources of transmission. Additionally, there was confusion about the types of face coverings that are recommended.²⁷

Pandey et al. reported that 19.6% of the respondents believed that only covering their nose, or mouth with a tissue or mask while coughing and disposing of it immediately is the way to prevent the spread, 16.9% only believed in social distancing and 40.2% believed that prevention for all the steps to be followed.²⁸ Haischer et al. reported that females and older had significantly higher odds to wear masks than males, middle-age and young individuals. Urban and suburban mask wear was similar but lesser in rural settings.²⁹

In the present study, we assessed knowledge and practice of using masks, unlike previous studies using the Likert scale, as the documented limitations in using a Likert scale are the following – social desirability bias, central tendency bias, acquiescence bias, and validity difficult to demonstrate.³⁰

Some limitations of this study should be considered. This study employed a cross-sectional design which precludes establishing causal relationships. A longitudinal study would be required to overcome this limitation. The small sample size and institutional setting may not be representative of the general population, so larger studies are needed to ensure greater representation.

5. Conclusion

Most of the subjects demonstrated good prior knowledge and practice regarding preventive COVID-19-appropriate measures. Overall awareness among the subjects was satisfactory. In addition, critical awareness, preventive strategies, and optimistic attitudes were integrated into knowledge through systematic approaches and health communication. Medical institutions should conduct health education for non-teaching staff on proper mask use, mask preparation using household materials, and disposal techniques. Institutional Policy mandating the use of face masks during working hours should be made. This study highlights the need for community leaders, stakeholders, and healthcare workers, especially primary healthcare physicians, to actively promote the proper and frequent use of masks, along with other protective behaviors against COVID-19 and other communicable diseases. As the long-term effects of COVID-19 are still being studied, and with the potential emergence of other viruses in the future, masks can serve as an effective and protective barrier against various communicable and potentially fatal diseases, as we have seen in the past year with COVID-19.

6. Conflicts of Interests

No conflicts of interests were disclosed.

7. Source of Funding


None.

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