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Original Research Article

Knowledge attitude and practices regarding mask usage during COVID-19 pandemic in general population of India: a qualitative study

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ABSTRACT

Background: Facemasks are recommended to control the COVID-19 pandemic transmission. This study was conducted with a purpose to investigate the knowledge, attitude and practices among general population regarding the usage of facemask during COVID-19 pandemic to limit the spread of the corona virus disease.
Methods: A cross sectional study was conducted through Google forms. Questionnaire consisted of 7, 3 and 5 questions on knowledge, attitude and practices respectively. Questionnaire was shared on social media. Score of 1 was assigned to correct response and score of 0 for incorrect response, thus making a maximum score of 7 for a subject. Accordingly, score was <3 depicts individual had poor knowledge. 3-5 and >5 had good and excellent knowledge respectively.
Results: Out of total 500 participants, we had 242 (48.4%) males and 258 (51.6%) females. The age of participants ranged from 20 to 60 years. Majority of participants (25.2%) were from Kerala State. Almost 97.6% reported that it was necessary to wear mask in current situation. The overall mean knowledge score was 5. The mean knowledge score was higher among females (5.07%) as compared to males (4.93%) and the difference was statistically significant. When they were asked if they know the correct steps of wearing a mask, almost 82.5% reported "yes" but while asking for coverage of mask on face only 75% were aware of it correctly.
Conclusions: The overall knowledge of our study population was good. The knowledge was excellent for the age group of 20–30 and post-graduates.

Keywords: COVID-19 pandemic, Facemasks, N95 masks, SARS-CoV-2, Surgical mask

INTRODUCTION

COVID-19 pandemic first appeared in Wuhan City, Hubei Province of China, in December 2019. With the constant rise in reported cases, the World Health Organization (WHO) declared this outbreak as a global pandemic on the 12 March 2020.[1] This disease which originated from bats and pangolins from Wuhan, China manifests as symptoms of fever, dry cough, and dyspnoea. Extra-pulmonary atypical symptoms like anosmia/hyposmia, dysgeusia, and diarrhoea can also be seen. Asymptomatic individuals can transmit the disease during incubation period.[1] The virus can survive on surfaces up to 5 days depending on the type of surfaces.[2,3]

The Government of India confirmed India's first case of COVID-19 on 30 January 2020, in the state of Kerala. As of 25 October 2020, Ministry of Health and Family

Welfare, Government of India has confirmed 7,864,811 COVID-19 cases and 118,534 deaths.[4] Extreme prevention methods like closing schools and universities, complete lockdown, social distancing, hand sanitization, use of face masks, contact tracing, and quarantine facilities became the new normal. Bridging a gap of knowledge about the emerging pandemic disease can prevent chaos and fear among the public. Public awareness, attitude and practices have been studied during previous epidemics such as swine influenza and Middle East Respiratory Syndrome (MERS).[5,6]

SARS-CoV-2 spreads primarily via respiratory droplets, ejected when speaking, coughing or sneezing. Face masks are recommended to control the COVID-19 pandemic transmission, and are made of different materials and designs which influence their filtering capability.[7,8]

The knowledge, attitudes and practices toward COVID-19 impart an integral role to understand society's readiness to accept and follow preventive guidelines from the health authorities. This baseline information helps to determine the type of intervention needed to change misconceptions about the virus. SARS outbreak taught us that knowledge and attitudes are coupled with levels of panic and emotions in society which could further complicate measures to contain the spread of the disease.[9,10]

Hence, this study was conducted with a purpose to investigate the knowledge, attitude and practices among general population regarding the usage of face mask during COVID-19 pandemic to limit the spread of the coronavirus disease.

METHODS

Study area

Study design

A cross-sectional survey was conducted through Google forms. A survey is most appropriate method as it allows large population to be assessed with relative ease. Because it was not feasible to do a community – based national sampling survey during the COVID-19 pandemic period, hence the data was collected online after a call of participation and questionnaire was shared on social media.[11]

Study period

The study period was from 17 November 2020 to 03 December 2020.

Study participants

We utilised several strategies to reach as many respondents as possible all over the country within the one-month data collection period. This included relying on professional and personal networks of the researchers, reaching out to community leaders and social media influencers to broadcast and share the survey. A standardised general description about the survey was given in the Whatsapp message/social media before the link of the questionnaire was provided. A total of 500 participants took part in the survey.

Study instrument

The survey instrument is an adaptation of the measures developed in a study on Chinese resident's knowledge, attitudes and practices (KAP) towards COVID-19 in China.[11] The questionnaire consisted of four main themes: demographics, which surveyed participant's sociodemographic information, including gender, age, state of residence, educational qualification and occupation; knowledge regarding mask usage during COVID-19 pandemic; attitudes towards mask usage during COVID-19 pandemic; and practices relevant to mask usage during COVID-19. The survey was offered in the English language.

To measure knowledge regarding the usage of mask during COVID–19, 7 questions were created. Participants were given response options to these questions. A correct response to a question was assigned 1 point, while an incorrect/blank response was assigned 0 point. The maximum total score ranged from 0–7, with a higher score indicating better knowledge about the usage of mask during COVID-19.

To measure attitudes towards mask usage during COVID-19, surveyed participants were asked whether they believe to wear mask necessarily in current situation of COVID-19 pandemic. They were also asked about their confidence to know the correct steps of wearing a face mask and what they think about cloth face mask effectiveness as compared to a regular surgical mask .To measure practices, participants were asked yes/no questions on whether they reuse the mask once wore; follow their local authorities advice on the use of masks; store the used surgical/cloth mask in a bag for later use if not sick. Participants were questioned for proper wearing, to which extent they need to cover their face with mask and how they remove their mask before eating?

Statistical analysis

The collected data were analysed using the statistical package for the social sciences (SPSS), version 20. Chi-square test, independent sample t-test and one-way analysis of variance (ANOVA) were utilised to determine the differences between groups for selected demographic variables. The statistical significance level was set at ($p<0.05$). Internal consistency of the knowledge measures was tested using a reliability test where the Cronbach alpha coefficient aided in determining the reliability of the variables. The results showed that the Cronbach alpha for knowledge (7 questions) was 0.761. The result added credence where according to Griethuijsen, the range of

Cronbach alpha within 0.6 to 0.7 is considered adequate and reliable.[12] It is attested that the questions used to measure knowledge on COVID-19 are therefore acceptable.

RESULTS

Demographic characteristics

A total of 500 participants participated in the study. Out of the total participants, the average age was 32.1±8.2 years (range=20-60), 258 (51.6%) were women; 126 (25.2%) and 112 (22.4%) resided in Kerala and Himachal Pradesh respectively; 262 (52.4%) were graduates (Table 1).

Table 1: Demographic characteristics of participants (N=500).

Characteristics	N	%
Gender		
Male	242	48.4
Female	258	51.6
Education		
Secondary	17	3.4
Higher secondary	43	8.6
Graduation	262	52.4
Post-graduation	178	35.6
State/UT		
Andhra Pradesh	7	1..4
Assam	1	0.2
Bihar	2	0.4
Chandigarh	3	0.6
Daman & Diu	8	1.6
Delhi	60	12
Gujarat	7	1.4
Haryana	12	2.4
Himachal Pradesh	112	22.4
Jammu & Kashmir	16	3.2
Karnataka	13	2.6
Kerala	126	25.2
Madhya Pradesh	5	1.0
Maharashtra	47	9.4
Nagaland	1	0.2
Odisha	6	1.2
Pondicherry	2	0.4
Punjab	9	1.8
Rajasthan	6	1.2
Tamil Nadu	24	4.8
Telangana	4	0.8
Uttarakhand	5	1.0
Uttar Pradesh	14	2.8
West Bengal	8	1.6

Assessment of knowledge

A total of seven questions were used to measure knowledge on mask usage during COVID-19 pandemic. Question's each correct response was given a score of 1 and score of 0 if incorrect, thus making a maximum score of 7 for a subject. Accordingly, if the score was <3, individual had poor knowledge, 3-5: good knowledge and >5 had excellent knowledge. The average knowledge score for participants was 5. The overall correct answer rate of the knowledge questionnaire was 71.5% while the range of correct answers for all participants were between 21.4 to 100%. The mean knowledge score was higher among females (5.07%) as compared to males (4.93%) and the difference was statistically significant (Table 2). The mean knowledge was highest for lower age group as compared to highest age group ($p<0.05$) (Table 3).

Table 2: Mean scores between genders using independent t-test.

Characteristics (gender)	Mean	SD	T value	P value
Male	4.93	1.60	4.499	0.036
Female	5.07	1.34		

The difference in mean score between males and females is statistically significant ($p<0.05$)

Table 3: Mean scores between age groups and education using ANOVA.

Characteristics	Mean	SD	F value	P value
Age groups (years)				
20-30	5.23	1.18	4.825	0.027
31-40	4.84	1.24		
41-50	4.49	1.38		
51-60	4.46	1.00		
Education				
Secondary	3.44	0.84	6.167	0.002
Higher secondary	4.43	1.03		
Graduation	5.06	1.21		
Post-graduation	5.13	1.22		

The differences in mean score between different educational levels and between different regions are statistically significant ($p<0.05$)

Most of the participants knew about the presence of valve in N95 masks and the purpose of metal strip in surgical mask is to fit on nose. They also knew that during home quarantine, while talking to someone and even at crowded places wearing mask is most important. Even so, there is noticeable confusion regarding which N95 mask (with or without valve) is more appropriate during COVID-19 pandemic (Table 4).

Assessment of attitude

Participants were asked three questions in assessment of attitudes. The first question asked whether or not they believe that it's really necessary to wear mask in current situation of COVID-19 pandemic; second, whether cloth face mask is as effective as a regular surgical mask or not;

and third, whether they are confident enough to know the correct steps of wearing a face mask.

For the first question, a majority of participants believed that it's really necessary to wear mask in current situation of COVID-19 pandemic (97.6%). Even so, 2.4% were unsure of it (Figure 1).

For the second question, more than half of the participants thought that cloth face mask is not as effective as a regular surgical mask (58.1%) (Figure 2).

For third question, majority of participants were confident enough to know the correct steps of wearing a face mask (82.5%) and 16.3% participants were still confuse about it (Figure 3).

Table 4: Participant's response to each question.

Statement	Response	N	%	χ^2 value	P value
How many types of masks do you know?	One	20	4.0	7.022	0.029
	Two	89	17.9		
	Three	220	44.3		
	Four	168	33.8		
Which mask is the best to protect you from COVID-19 pandemic?	Cloth mask	99	20.0	9.663	0.007
	Surgical mask	39	7.9		
	N95 mask	356	72.1		
Do you know about the valve in N95 mask?	Yes	424	85.8	10.474	0.005
	No	70	14.2		
Is it appropriate to use N95 mask with valve during COVID-19 pandemic?	Yes	163	33.5	8.408	0.014
	No	324	66.5		
What is the most important time to use mask?	During home quarantine	0	0.0	9.099	0.011
	When talking to someone	19	3.8		
	At crowded place	83	16.7		
	All of the above	395	79.5		
Which N95 mask is most appropriate during COVID-19 pandemic?	With valve	134	27.9	7.712	0.021
	Without valve	346	72.1		
What is the purpose of metal strip on surgical mask?	To fit on nose	480	97.2	8.226	0.016
	To fit on chin	8	1.6		
	No purpose	6	1.2		
Do you believe that it's really necessary to wear mask in current situation of COVID-19 pandemic?	Yes	484	97.6	11.534	0.003
	No	12	2.4		
Do you think that cloth face mask is as effective as a regular surgical mask?	Yes	207	41.9	8.668	0.013
	No	287	58.1		
Are you confident enough to know the correct steps of wearing a face mask?	Yes	411	82.5	6.077	0.047
	No	6	1.2		
	May be	81	16.3		
Do you reuse the mask once wore?	Yes	274	55.8	8.573	0.035
	No	217	44.2		
For proper wearing, to which extent do you need to cover your face with mask?	Nose and mouth	123	24.8	10.895	0.027
	Nose, mouth and chin	372	75.0		
	No purpose	1	0.2		
Do you follow your local authority's advice on the use of mask?	Yes	366	74.7	6.331	0.011
	No	24	25.3		
How do you remove your mask before eating?	Pull it below chin	78	15.7	13.687	0.001
	Remove it completely	408	82.1		
	Other	11	2.2		
If you are not sick, do you store the used surgical/cloth mask in a bag for later use?	Yes	233	47.1	6.697	0.009
	No	262	52.9		

Assessment of practices

Practices towards mask usage during COVID-19 pandemic were measured using 5 questions enquiring on: reuse of the mask once wore; extent to cover your face with mask; follow local authorities' advice on the use of masks; how they remove your mask before eating; storage of the used surgical /cloth mask in a bag for later use.

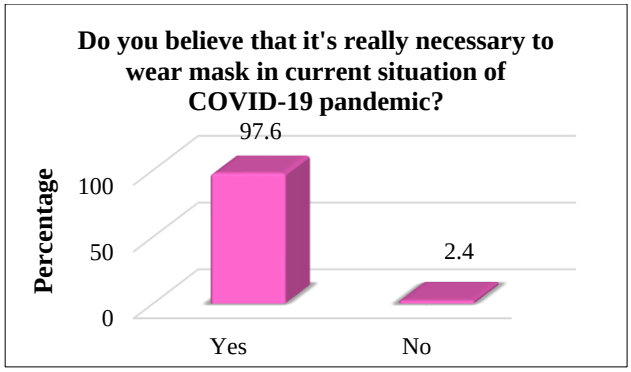

Figure 1:

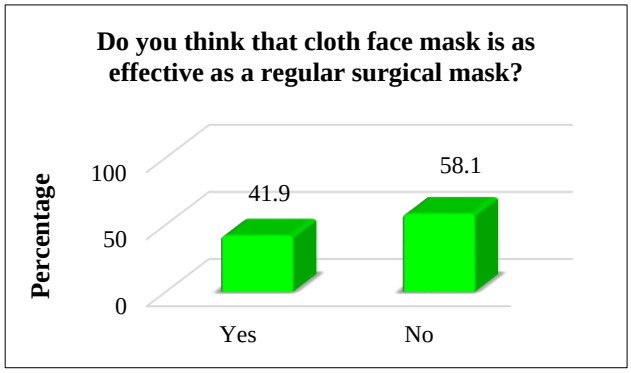

Figure 2:

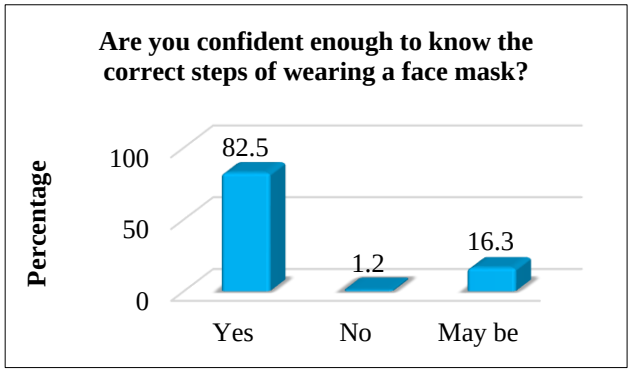

Figure 3:

Majority of the participants cover their nose, mouth and chin with the face mask (75%), follow their local authority's advice on the use of mask (74.7%) and completely remove the mask before eating (82.1%). Whereas more than half of the participants use the mask once wore (55.8%) and if not sick, didn't store the used surgical/cloth mask in a bag for later use (52.9%).

DISCUSSION

COVID-19 is a relatively new virus that has had devastating effects within the short time since it was first detected.[13] SARS-CoV-2 is the third coronavirus to have threatened global public health in the past 20 years, following severe acute respiratory syndrome coronavirus (SARS-CoV) in 2002 and Middle East respiratory syndrome coronavirus (MERS-CoV) in 2012.[14] To the best of our knowledge, this is the first study in India examining KAP regarding the usage of facemask during Covid-19 pandemic. Majority of participants (25.2%) were from Kerala State. Almost 97.6% reported that it was necessary to wear mask in current situation. The mean knowledge score was higher among females (5.07%) as compared to males (4.93%) and the difference was statistically significant. The mean knowledge was highest for lower age group as compared to highest age group ($p<0.05$). When they were asked if they know the correct steps for wearing a mask, almost 82.5% reported "yes" but while asking for coverage of mask on face only 75% were aware of wearing the mask correctly.

Given the similarity of SARS-CoV-2 (COVID-19) and SARS-CoV, initial political recommendations in China highlighted the use of masks and N95 respirators for protection against COVID-19. However, evidence-based guidelines remain scarce. By definition, N95 respirators are designed to reduce oral entry of small airborne particles with clear filtration requirements. The respirator must fit tightly to wearer's face with limited seal leakage to be effective. Medical masks, also known as surgical masks, are used to protect the wearers from microorganism transmission, specifically during hand-to-face contact and large droplets and sprays. Both masks and N95 respirators are used to protect against airborne viral pathogens such as SARS-CoV and influenza virus.[7]

When someone is breathing, speaking, or coughing, only a small amount of what is coming out of their mouths is already in aerosol form.[15] Nearly all of what is being emitted is droplets. Many of these droplets will then evaporate and turn into aerosolized particles that are 3 to 5- fold smaller.[16] A previous review of published literature, including 67 randomized controlled trials and observational studies, indicated that surgical masks and N95 respirators were supportive measures offering the most consistent protection.[17]

CONCLUSION

The overall knowledge of our population was good. The knowledge was excellent for the age group of 20–30 and post-graduates. Due to limited access to internet and online health information resources, vulnerable populations of Indian society under the COVID-19 epidemic such as older adults and rural people at grass-root level are more likely to have poor knowledge, negative attitudes, and inappropriate preventive practices regarding mask usage during COVID-19 pandemic .Therefore, there is still need of educating the masses regarding the proper usage of mask.

India surely will win the battle against COVID-19 in the near future. Due to the limitation in representativeness of the sample, more studies are warranted to investigate the

KAP regarding mask usage during COVID-19 among Indian residents of a low socioeconomic status.

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