



Use of Face Masks in India during COVID-19: Common Problems Faced during Mask Use and Solutions

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ABSTRACT

Present study was conducted with the aim of documenting the problems faced while wearing face masks regularly due to COVID-19 pandemic. Data obtained by online survey were statistically analyzed by percentage, mean, standard deviation and one way ANOVA. Findings from 267 respondents suggest that most mask wearers were troubled by pressure ulcers due to continuous use, pain around the ears/nose due to constant pressure by the mask, skin irritation and steaming up of eyeglasses. Appropriate solutions for reducing the problems have been suggested. More than fifty percent of the subjects expressed a positive overall mask experience. A majority (84%) of the respondents were ready to make mask a part of their daily ensemble. The effect of profile characteristics i.e. gender, age, education, employment sector and profession on the overall experience of wearer regarding mandatory mask usage has been reported. The study was instrumental in gathering valuable data pertaining to mask use during the first wave of corona and the common problems faced by the respondents.

Key Words: COVID-19, Face mask, Sanitization, Problems Mask use.

INTRODUCTION

Since the advent of SARS CoV-2 in December 2019, wearing masks, using sanitizers and disinfectants, maintaining social distancing has become the part of daily life. One cannot go on with the daily routines without practicing these new normal norms. Various countries went through third wave in the beginning of 2022. Most countries continue to enforce laws which curtail the pandemic. In India, where Epidemic Disease Act 1897 is in force, with latest amendment in 2020, in all states and union territories since March 2020, it is mandatory to use masks to contain COVID-19 (Anonymous, 2021). Several attempts have been made to predict the course of the disease in future to be better prepared to fight the pandemic (Alarjani *et al*, 2022; Behnam and Jahanmahin, 2021; Ketu & Mishra, 2022). Effect of vaccine and booster roll out on pandemic's progression seems to be evened

out by inevitable mutations. Although the incidence of positive cases has dipped, leaving homes without masks and sanitizers can still not be imagined in any time soon in future (Malki *et al*, 2021).

With this background, research has been undertaken in the month of May 2020 and the findings have been reported in two papers titled – “Use of masks in India during COVID-19: Users perspective regarding awareness and selection” detailing demographic information as well as types of masks preferred by the subjects (Sornapudi *et al*, 2021) and “Use of face masks in India during COVID-19: An exploration of the behavioral tendencies of mask users” deliberating purchase of masks and their usage at the workplaces as well as safety practices followed during the pandemic (Soni *et al* 2022). The present study was conducted to understand the problems faced during regular mask use and document the mitigation strategies thereof.

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MATERIALS AND METHODS

Data were collected using Google forms during the first lockdown period in India *i.e.* in May 2020. Questions were asked pertaining to problems faced by the users while regular use of masks. Profile characteristics and detailed methodology have already been stated in elaborate by authors in the previous 3 works, with distinctive themes, of this series. The results of the problems faced during mask use were grouped into ‘no response’, ‘always’, ‘sometimes’, and ‘never’ categories, which were given a score of 1,2,3,4 respectively. The total score against each problem was thereby calculated. Each of the problems expressed was presented in descending order using the mean score. One way ANOVA, performed by using SPSS, analyzed any significant dependency of “overall experience of mask usage” on “profile characteristics”.

RESULTS AND DISCUSSION

Problems faced while wearing the mask:

Problems during mask use: Pressure ulcer due to continuous use (Solomon *et al*, 2021), pain around the ears/ nose due to constant pressure by the mask, and irritation of skin covered with mask were the top three problems with a mean score of 2.92, 2.84, and 2.82, respectively (Figure 1). Other problems faced by the respondents while using the masks were steaming up of eyeglasses (mean score 2.82), restricted breathing (mean score 2.75), and unclear speech (mean score 2.73). Reported findings regarding mask use associated problems are consistent with the results of similar studies which state the above mentioned issues (Gürlek Kısacık and Özyürek, 2022; Huang *et al*, 2021; Morishima *et al*, 2021; Pinzan-Vercelino *et al*, 2021).

Reusable masks should be made in sizes (XS, S, M, L, XL) to fit the face type. To arrive at the sizes, the Indian 3D face measurement data could be employed.

Reusable masks may be made according to an individual’s measurement or can be custom made.

Elastic in reusable masks may have a provision to be loosened or tightened rather like a decorative clasp that can help in adjusting the fit around the face.

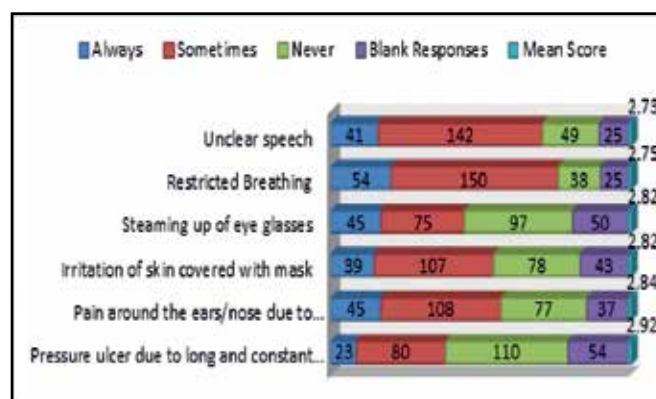


Figure1. Problems faced by subjects during mask use
Solutions to mitigate the above-mentioned problems:

Masks may have one large and one small string with the smaller one at the neck so that it doesn’t have to rest on the ear. The larger string can hold the head while the mask is in use.

The fabric used for making the mask may be soft to make it comfortable.

A three-layer mask with an outer hydrophobic layer and an inner cotton layer would be ideal in restricting the path for virus travel. The outer layer repels water while the inner layer absorbs the sweat.

If a soft and stretchable cloth is used, it must always be of at least two layers for added protection.

A multilayered cloth mask is better in protecting the user against virus attacks.

Using a good breathable fabric for making a mask is of paramount importance.

Using masks with ties that go around the head rather than the ears.

In a study (Schallom *et al*, 2015) on ICU patients, it was found that patients with full face masks proved to be less prone to pressure ulcers and mask-associated discomfort. Hence, full face masks along with a face shield can also be an alternative when people need to wear them for long hours.

Overall views regarding masks

Overall experience of mask use: Overall, the respondents were asked to categorize their mask experience into 'positive', 'negative', and 'mixed'. More than fifty percent of the subjects expressed a positive emotion (63%), 34% conveyed a mixed feeling while 3% reported a negative feeling. (Figure 2.)

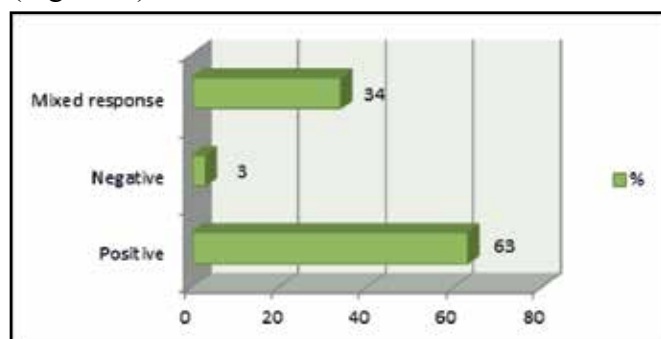


Figure 2: Overall experience of respondents regarding mask usage

Respondents' readiness to adopt masks as a part of daily life post lockdown: Since the data was collected by the research team during the lockdown, the subjects were asked to indicate their keenness in making masks a part of their ensemble. Responses obtained have been presented in table 1.

Table 1. Willingness to wear mask post lockdown.

Willingness to wear mask post lockdown	Frequency	%
No	42	16.00
Yes	225	84.00
Total	267	100.00
1-2 months	56	21.00
3-6 months	74	28.00
More than 6 months	95	36.00
Total	225	100.00

A majority (84%) indicated that they were ready to make it a part of their everyday clothing, with 36% of the affirmative people were willing to adopt it for more than 6 months. Although it is an irony that it has been more than a year since the first case of coronavirus was reported in Wuhan. It appears that the mask is here to stay for a significant

time in the near foreseeable future. Although it is impossible to #StaySafeStayHome for an indefinite period, practicing #SocialDistancing, washing hands regularly, and donning the ubiquitous face mask are sure to help in #FlattenTheCurve; not to forget the age-old saying #prevention and #safety is much better than cure. It is imperative that #wearamask can #StopTheSpread of #coronavirus and ultimately results in '#savealife'.

Table 2. Willingness to wear the mask post lock down v/s Age

Willingness to wear the mask post lock down			
Age	Yes	No	Total
Less than 18 years	4	2	6
19-28 years	88	15	103
29-38 years	51	11	62
39-48 years	38	10	48
49-58 years	31	1	32
59-68 years	12	2	14
Above 69 years	1	1	2
Grand Total	225	42	267

The willingness of the subjects in using mask after lifting of lockdown was cross tabulated with age. It was interesting to note that 19-28 yr age group appeared to be more willing to make it a part of their daily routine followed by 29-38 yr old respondents.

Research Question: Is there any significant relation between the overall experience of mask usage to the profile characteristics?

H0: There is no relationship between the overall experience of mask usage to the profile characteristics

H1: There is a relationship between the overall experience of mask usage to the profile characteristics

Statistical Analysis:

Inference

Data in Table 3 shows that there was a significant difference between profile characteristics such as

Table 3. One-way ANOVA between the overall experience of mask usage to the profile characteristics

Profile Characteristics		% of Averages	SD	F cal	P-value	Remark
Gender	Female	52.3333	44.9925	6.9789	0.0744	Not Significant
	Male	44.00	25.98076			
Age groups	Less than 18 years	2.247191	0.00	4.171085	0.032478	Significant
	19-28 years	37.82772	28.4312			
	29-38 years	23.22097	18.50225			
	39-48 years	17.97753	13.52775			
	49-58 years	11.98502	12.89703			
	59-68 years	5.243446	7.234178			
	Above 69 years	0.749064	0.57735			
Education	Degree	38.20225	28.51315	8.5772	0.0174	Significant
	Post Graduate	17.603	13.50309			
	Doctorate	43.44569	37.0045			
Employer	Primary Sector	16.85393	12.00	11.341	0.0017	Significant
	Secondary Sector	37.07865	26.51415			
	Tertiary Sector	12.35955	14.00			
	Quaternary Sector	16.10487	12.2202			
	Quinary Sector	16.85393	16.09348			
Profession	Govt. Employee	25.09363	23.58672	0.853646	0.5232	Not Significant
	Private Employee	28.46442	24.4404			
	Retired	5.243446	7.234178			
	Self-employed/ Own Business	11.61049	9.291573			
	Student	28.83895	17.92577			

At 5% level of Significance

age group, education, and employer modes on the overall experience of mask usage, which include 'positive', 'negative' and 'mixed'.

There was no significant difference between genders and professions on overall mask usage experience, as P-value is > 0.05 .

When the data on age is observed, it was apparent that subjects in 19-28 yr showed higher satisfaction in mask use as their % on average was more (37.82772) when compared with other age groups. One can spot a reverse trend, as age

increases the acceptability level of masks seem to decrease progressively. The younger subjects seem to embrace the idea of a mask, maybe more comfortable while using it, and are willing to make it a part of their daily routine. They do understand the protective nature of masks and are more inclined to use them as a prophylactic measure since they cannot stop from going out for errands or attend to their jobs. Alternatively, the older subjects are reserved and not so outgoing; may be seen resisting change. Given their inflexible disposition to things

in general, one can draw out the conclusion that their mask experience has not been smooth. An observational survey of public areas of Jefferson County, Kentucky indicates that 19-44-year-old male population were the most prevalent among those unmasked and masked incorrectly (Karimi *et al*, 2020).

Doctorate holders show higher contentment in the use of masks as the data shows a higher % of average (43.44569) as they were expected to have a reasoning bent of mind which can link the positives of mask usage to prevention and spread of corona virus. Moreover, they would have researched on their own about the usefulness of masks and read on scientific studies to substantiate their beliefs.

People working in the secondary sector were highly satisfied with their mask use experience as their % of average was higher among all (37.07865). Subjects working in this sector did not have sedentary jobs, since their frequency in moving out was more; they had to do the mask quite often. So, mask use was more and would have been a necessary evil in their line of work, hence one can observe a higher acceptance of mask.

A close observation of the data related to profession shows that both private employees and the student categories in the study group were highly contented when it comes to their mask use experience as their % of averages was almost the same. But when we compare the SD, it was clear there is a wide variation in data of private employees as their SD is greater (24.4404) than students (SD = 17.92577). Hence it can be concluded that students seem to have a positive mask usage experience.

CONCLUSION

The present research paper, a fourth in the series, has focused on problems faced by mask users during the first wave in India. Pressure ulcers, pain around ear and nose, irritation of covered skin and steaming up of eyeglasses were the prominent issues faced by the subjects. The research team has suggested solutions to the above-mentioned

problems. These suggestive solutions can be of use to individual buyers, medical personnel, researchers, and production companies. People of secondary sector are those who cannot work from home and must wear mask hence are left with no other option but to make mask a part of their life. Students and private employees out of all respondents have reported their overall experience with daily mask use as positive. Interesting inverse relationship between age and mask acceptance was observed, although association between higher mask usage in young age can be deceiving because of the difference between wearing a mask and wearing it correctly. Uneasy breathing, sweating, visual blocking, extreme discomfort, less obligation to go out might be the plausible reasons for the responses given by elderly.

Finally, it can be deduced that easy adaption to regular mask usage is linked to those segments of the population who need to step out of the house everyday plus understand its effectiveness for limiting the Corona virus spread such as younger population, secondary sector & private sector employees and doctorate holders.

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Received on 20/03/2022

Accepted on 15/09/2022