

## Awareness, Preferences, and Consequences of Mask Usage among MBBS Students

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### Abstract

**Background:** Research studies have shown that the wearing mask for more than 4 hours could lead to Nasal, Skin, Pressure, and other miscellaneous symptoms.

MBBS students tend to use masks for longer duration than any other set of people.

There is limited evidence of adverse effects of prolonged mask usage among MBBS students. This study was conducted with objectives to: To assess the knowledge, practice and preferences of mask usage, to estimate the prevalence and determine the adverse effects of prolonged mask wearing among MBBS students.

**Material and Methods:** This is a Cross sectional study conducted among 313 MBBS Students of ESIC Medical College and Hospital, Kalaburagi, through an online semi-structured Questionnaire. The collected information is analyzed using MS Excel and SPSS software.

**Conclusion:** In this study it was observed that the knowledge and practice among participants were positively correlated and most of the consequences were negatively correlated with the practice. Thus, participants with good knowledge and practice scores had few complaints while wearing mask for prolonged hours.

**Key words:** Mask usage, Knowledge, Preference, Adverse effects, Prevalence.

### Introduction

For the first time Mikulicz introduced a single layered mask which was made of gauze. Later, in the year 1920 surgical masks were introduced in operation theatres of Germany and USA<sup>[1]</sup>.

Moreover, considering that the mode of transmission of COVID-19 and several other infections is through air droplets and organs like nose and mouth being the route of entry, it is recommended to cover it appropriately. The era of COVID-19 since

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its declaration as a pandemic by WHO on 11 March 2020 has brought several changes in the lifestyle of people universally. Public is aware of the importance of wearing mask more than ever.

There is diversity in type of masks, WHO recommends usage of three-layered masks, inner layer made of absorbent fabric like cotton, middle layer like polypropylene, outer layer made of polyester blend. Every person has an option of mask which suits their comfort.

Research studies have shown that the prolonged mask wearing could lead to headaches, skin breakdowns, itching, ear pain, discomfort, redness, dryness, rash, nasal bridge scarring also, there is evidence that the prolonged use of masks i.e., more than 4 hours may cause inconvenience [2-6]. Since the beginning of COVID-19 infection, MBBS students tend to use masks for longer duration due to their visits to hospitals and classes at college, hence they are expected to be well versed with the mask usage to avoid adverse effects on health due to wearing of mask.

There is limited information regarding adverse effects of prolonged mask usage among MBBS students and its association with their awareness and practice, thus this study aims to assess the knowledge, practice of mask wearing habits among the MBBS students and to determine their preferences and the various adverse effects of mask wearing among MBBS students.

### Material and Methods

This is a Cross sectional study conducted among MBBS Students of ESIC Medical College and Hospital, Kalaburagi; through an online semi-structured Questionnaire prepared in Google form and circulated among students via Whatsapp. It comprised of questions related to socio-demographic details, knowledge regarding mask and its usage, practice followed for wearing mask, preferences for mask usage and the consequences faced due to prolonged wearing of a mask.

After obtaining Institutional ethical clearance and seeking permission from teaching staff, the students

of MBBS were approached at end of their subject class and were briefed with the study details. The link for the predesigned semi-structured questionnaire was shared with the students, with a setting such that the questions could be accessed only after obtaining the participants consent.

Students unavailable for three consecutive attempts to connect were not included in the study, and thus a total of 313 responses were obtained over a period of 3 months. Total duration of study was 6 months (March-August, 2022).

The collected information was then analyzed using MS Excel and SPSS software version 21. Descriptive analysis was used to describe the socio-demographic information, and other parameters. Pearson's correlation was used to assess associations between the variables.

### Results

**Table 1: Socio-demographic details of the study participants.**

| Variable             |                    | Frequency (N=313) | Percent |
|----------------------|--------------------|-------------------|---------|
| Age group            | Less than 20 years | 135               | 43.1    |
|                      | 20 to 22 years     | 149               | 47.6    |
|                      | 22 to 25 years     | 25                | 8.0     |
|                      | More than 25 years | 4                 | 1.3     |
| MBBS Year            | 1                  | 43                | 13.7    |
|                      | 2                  | 155               | 49.5    |
|                      | 3 Part I           | 82                | 26.2    |
|                      | 3 Part II          | 33                | 10.6    |
| Gender               | Female             | 176               | 56.2    |
|                      | Male               | 137               | 43.8    |
| Current living place | Home               | 37                | 11.8    |
|                      | Hostel             | 269               | 85.9    |
|                      | Paying Guest       | 7                 | 2.2     |

In addition to the information in table 1, it was observed that almost 36% (112) of the participants had refractive error while 11.2% (35) have acne prone and sensitive skin.

**Table 2: Distribution of study participants according to knowledge based questions.**

| Statement with correct response  | Frequency (N=313) | Percent |
|--|-------------------|---------|
| Able to distinguish external and inner surface of a mask                         | 303               | 96.8    |
| Able to distinguish upper and lower edge of a mask                               | 307               | 98.1    |
| A surgical mask has 3 layers   | 241               | 77.0    |
| Middle layer of surgical mask acts as a filter media barrier from COVID 19 virus | 226               | 72.2    |
| A surgical mask is recommended to be worn for not more than 4 hours.             | 125               | 39.9    |
| Surgical mask should cover nose and mouth and chin when worn.                    | 280               | 89.5    |
| The metal strip on a surgical mask should fit on the nose                        | 307               | 98.1    |

In this study, 93.3% (292) of the participants believed that 'single use mask' would mean 'a mask once worn by a person has to be discarded after it is removed.'

Awareness of study participants regarding

different types of masks is shown in Figure 1, but regarding practice, it was noted that 23% (72) of the participants would use cloth mask, 70% (219) preferred using a single use surgical mask, whereas 7% (22) use several types of masks in a day.

**Table 3: Distribution of Participants according to Practice based questions.**

| Statement with recommended Practice                             | Frequency (N=313) | Percent |
|---|-------------------|---------|
| Continue wearing your mask while coughing and sneezing          | 263               | 84.0    |
| Do not store the used mask in a bag for later use               | 218               | 69.6    |
| Do not Eat/drink while wearing the mask                         | 252               | 80.5    |
| Remove the mask from the face by touching only the bands        | 262               | 83.7    |
| Do not pull the mask up over the forehead or down over the chin | 188               | 60.1    |
| Clean hands after taking off the mask                           | 229               | 73.2    |

The practice of study participants related to wearing mask is depicted in table 3 and figure 3a&b.

The study also reveals that the participants were aware of cleaning a reusable mask every day (36%, 111) or after every use (56%, 175), there were also 3% (8) participants who thought that a reusable mask should be washed once it is visibly dirty.

On further analysis, it was noted that almost 88%

(275) of the participants had adequate knowledge regarding types of masks and its usage (Mean score = 9), and 82% (257) of the participants had good practices while using a mask (Mean score = 7).

On further analysis positive correlation was noted between the Knowledge and Practice scores with  $R^2=0.1868$ , meaning that participants with good knowledge regarding mask usage had better practice.

Significant association was determined between the gender and the practice among the study participants. Better mask wearing practices were found among female participants ( $p = 0.0066$ , at 95% CI and  $z$ -value = 2.74). It was also noted that there was significant association among practice and academic year of the study participants ( $p = 0.03$ , at 95% CI and  $F$ -value = 2.64).

In this study it was noted that 70% (217) of the participants wouldn't compromise the quality of mask but the other 30% (96) would compromise the quality of mask for its cost.

The study participants had various complaints due to prolonged wearing of mask. There were about 66% (206) participants who had nasal complaints like feeling of dry nose, burning sensation in nose, blockage; about 54% (168) of the participants suffered with Pressure symptoms like pain behind the ear, on

the nasal bridge; there were 170 (54%) participants who had skin related problems due to wearing of mask whereas about 98 (31%) of the participants had disturbance in vision while wearing the mask. There were 143 (46%) participants who suffered with hypercapnia symptoms like suffocation/ breathless and feeling drowsy while wearing mask.

It was also noted that 68% (213) of the study participants agreed that their symptoms would gradually subside after removing the mask.

Detailed analysis related to consequences of prolonged wearing of mask reveals that among the study participants, excessive sweating was the most common consequence which would initiate within 1 hour of wearing mask among 34% (77) of the participants and by end of 3 hours approximately 49% (191) of the participants had complaints of skin irritation.

**Table 4: Correlation table between Practice, Knowledge, and the symptoms due to prolonged wearing of mask.**

|   |                     | Nasal symptoms | Skin symptoms | Pressure symptoms | Optical symptoms | Hypercapnia symptoms | Practice | Knowledge |
|---|---------------------|----------------|---------------|-------------------|------------------|----------------------|----------|-----------|
| Practice  | Pearson Correlation | -.130*         | -0.054        | -0.054            | -.124*           | -0.083               | 1        | .282**    |
|   | Sig. (2-tailed)     | 0.021          | 0.345         | 0.345             | 0.028            | 0.141                |          | 0         |
|   | N                   | 313            | 313           | 313               | 313              | 313                  | 313      | 313       |
| Knowledge   | Pearson Correlation | -0.019         | 0.011         | 0.011             | 0.014            | 0.06                 | .282**   | 1         |
|   | Sig. (2-tailed)     | 0.734          | 0.844         | 0.844             | 0.807            | 0.287                | 0        |           |
|   | N                   | 313            | 313           | 313               | 313              | 313                  | 313      | 313       |
| ** Correlation is significant at the 0.01 level (2-tailed). |                     |                |               |                   |                  |                      |          |           |
| * Correlation is significant at the 0.05 level (2-tailed).  |                     |                |               |                   |                  |                      |          |           |

The above-mentioned sufferings due to mask usage were found to be negatively correlated with the knowledge and practice of study participants (depicted in Table 4), meaning that among the participants with good knowledge and practice, the number of symptoms due to prolonged mask usage were less.

## Discussion

For a face mask to provide effective protection against micro-organisms, the Health Care Worker must have an intimate knowledge of wearing and disposing masks, however, a study conducted

among Wachemo University Students revealed that the overall knowledge of the students having good knowledge (AOR = 4.40; 95%CI; 2.13, 9.14) were found to be independently associated with face mask utilization.<sup>[7]</sup> In another study conducted by Kumar J et al, 88.5% of participants thought that they knew the proper steps of wearing a surgical face mask only 35% obtained a good score by answering the procedural questions correctly.<sup>[8]</sup>

In a study conducted by Oleg V. Mitrokhin, it was observed that about 2/3<sup>rd</sup> of their study participants were aware of rules for using masks.<sup>[9]</sup> In a study conducted by Larebo in Southern Ethiopia showed

that the 89.9% of their participants were aware of the correct use of surgical mask<sup>[7]</sup>. Similarly in our current study it was found that 88% of the participants had adequate knowledge regarding masks and its usage.

In a study conducted among health care workers it was found that around 43.6% of the study participants knew about the correct method of wearing the masks, 68.9% knew that there are three layers, 53% stated that the middle layer act as a filter media barrier, and 75.5% knew the recommended maximum duration of wearing it.<sup>[8]</sup>In our study it was noted that 77% knew that there are three layers, 72.2% stated that the middle layer act as a filter media barrier, and 39.9% knew the recommended maximum duration of wearing it.

In a study conducted at Shanghai it was noted that 41.61% of the study participants had selected both disposal surgical mask and N95 masks for usage, and 96.67% of the respondents replied that they would wear mask in public places.<sup>[10]</sup>Results of a study among university students in Vietnam showed that, the most common type of mask used were surgical mask (57.6%, 419/728), followed by non-antibacterial cloth mask (23.1%, 168/728). Among 168 participants using non-antibacterial cloth mask, 43.5% reused masks (73/168), of whom 6.8% (5/73) did not wash their masks at least daily.<sup>[11]</sup>In study conducted by Ekaterina A Shashina et al revealed that 89.1% of their participant used disposable medical face masks, 27.4% used reusable cloth face masks and 13.2% used respirators.<sup>[12]</sup> But in our study, cloth mask (91%) was more popular among the participants followed by respirators (N95) (88%), and 70% of the study participants would use single use surgical mask and 23% preferred using cloth mask.

In our current study it was observed that 40% of the study Participants rightly believed that WHO recommends to wear a surgical mask for not more than 4 hours, this finding is similar to an article published in BMJ which revealed that the accuracy of the mask replacement time was 25.63% (316/1223).<sup>[10]</sup>In a study conducted by Ekaterina A Shashina et al, it was noted that 25.1% of their respondents changed their disposable mask after 2-3h of wearing, while 13% decontaminated and used it several times, most of them being cloth face mask users who would decontaminate the mask daily (55.7%).<sup>[12]</sup>In our study

it was also noted that there were about 36% and 56% of the participants who believed in cleaning a reusable mask every day and after every use respectively.

In our current study, Statistically significance was determined between the gender and the practice among the study participants. Better mask wearing practices were found among female participants. Which is similar to a study conducted by Bhawna Sayare, wherein the mean knowledge score was higher among female participants (5.07%) as compared to male participants (4.93%) and the difference was statistically significant.<sup>[13]</sup> But in studies conducted by Howard M C and by Mitrokhin, though the men were less likely to wear face mask no significant gender differences were noted.<sup>[14, 9]</sup> It was also noted that there was significant association among practice and academic year of the study participants ( $p = 0.03$ , at 95% CI and F-value = 2.64), this finding is similar to finding of our current study.

The facemask properties related to users comfort are important, some of which noted in our current study are: easy to breathe through material, material protects from splashes, non-breakable material of mask, odourless mask, soft and thin mask, biodegradable material, material that does not cause sweating, material that is reusable. Similar findings were observed in a study conducted by Venesoja A et al.<sup>[15]</sup>

In a study among medical university students it was found that the most common side effects were redness, dryness, and itching of the skin, and also appearance of rashes.<sup>[9]</sup> another study among healthcare workers reveal similar findings of adverse effects due to prolonged use of mask, headache being the most common complaint (n=245), followed by: skin breakdown (n=175), acne (n=182), impaired cognition (n=81).<sup>[2]</sup>In our current study similar findings were observed, 66% of the participants suffered with nasal symptoms, 54% suffered with Pressure symptoms, 54% participants had skin related problems, 31% of the participants had disturbance in vision and 46% of the participants had hypercapnia symptoms due to prolonged wearing of mask.

## Conclusions

Awareness regarding types of mask and it usage is the need of today for well-being. As observed in

this study, people with better knowledge tend to have better mask usage and thus fewer complaints despite wearing mask for longer duration. Most common complaint related to mask usage was excessive sweating and skin irritation. There was preference for a breathable and eco-friendly mask.

More research is needed, to assess and optimize the facemask for different operating environments, and for different purposes in healthcare settings. People should be encouraged to implement the knowledge while using the mask, in this way healthcare professionals would perform better even during epidemics without compromising their own safety or their patients.

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