To Study the Awareness and Practice about Mask Usage Among Dental Professionals in a Dental College and Hospital ofWestern India

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Abstract

The relentless evolution of the COVID-19 pandemic, marked by the emergence of new variants, necessitates a nuanced understanding of preventive measures. Dental professionals, inherently at elevated risk, stand as a critical demographic in the ongoing battle against the virus. This study explores the awareness and practice of mask usage among dental undergraduate students in a tertiary healthcare dental college in Western Maharashtra, India, against the backdrop of the highly transmissible BF.7 sub-variant of Omicron. A descriptive cross-sectional study, guided by rigorous ethical considerations, was conducted. A representative sample of 300 dental undergraduate students was selected using simple random sampling. A standardized questionnaire assessed various facets of mask usage, and statistical analysis was performed using SPSS version 20. Preliminary findings indicate a heightened awareness of correct mask usage and disposal, with 75% of participants reporting adherence to recommended practices. The study unveils nuanced insights into procurement habits, maintenance practices, frequency of change, and disposal patterns among dental professionals. This study contributes valuable insights into the knowledge and practices surrounding mask usage among dental professionals, crucial in mitigating the risk of COVID-19 transmission. The findings lay the groundwork for targeted interventions and improvements in safety protocols within this vulnerable cohort, ensuring the continued provision of essential dental services amidst the evolving landscape of the pandemic.

Keywords: COVID-19, dental professionals, mask usage, BF.7 sub-variant, Omicron, preventive measures, awareness, practice, tertiary healthcare, Western Maharashtra.

I. Introduction

The advent of the COVID-19 pandemic in December 2019 marked a watershed moment in global health, challenging societies, healthcare systems, and professionals worldwide. The rapid transmission of the novel Coronavirus, officially named SARS-CoV-2, prompted unprecedented responses to contain its spread and mitigate its impact. As the world grappled with the evolving nature of the pandemic, various strains and variants emerged, each presenting unique challenges to public health. In the context of the ongoing battle against COVID-19, the dental community emerged as a group at heightened risk due to the nature of their profession. Dental care workers, providing essential services involving close contact and exposure to bodily fluids, found themselves on the front lines of potential infection. The risks were compounded by the subsequent identification of new variants of concern, each posing distinctive threats to human health. This study, conducted in a tertiary healthcare dental college in Western Maharashtra, India, seeks to delve into a critical aspect of preventive measures against COVID-19—mask usage among dental professionals. Against the backdrop of the discovery of the highly transmissible BF.7 sub-variant of Omicron in October, the imperative to understand the awareness and practice of mask usage becomes even more pronounced. BF.7's heightened ability to infect, characterized by a shorter incubation period and increased likelihood of reinfection, necessitates a nuanced exploration of preventive measures to curb further transmission.

The World Health Organization's declaration of COVID-19 as a pandemic in March 2020 set the stage for a global response, encompassing a spectrum of interventions from social distancing to frequent handwashing. Among these, the universal acceptance and implementation of wearing face masks emerged as a cornerstone in the non-pharmaceutical arsenal against the virus. Its cost-effectiveness and ease of adoption propelled mask-wearing into a widespread practice globally.

However, the efficacy of any preventive measure hinges on the knowledge and adherence of the population it intends to protect. Variability in understanding and practice of mask usage has been observed across diverse populations. Recognizing this variability, our study endeavors to illuminate the specific context of dental professionals within the larger canvas of the pandemic. By assessing their knowledge, procurement habits, maintenance practices, frequency of change, and disposal patterns regarding masks, we aim to contribute valuable insights that can inform targeted interventions and enhance the overall safety of this vulnerable group.

The methodology employed in this study adheres to rigorous standards, with ethical approval obtained from the University's Ethics Committee and informed consent secured from all participants. The inclusion and exclusion criteria ensure a focused and representative sample, comprising dental undergraduate students who are Indian nationals and proficient in English. The sampling technique, guided by simple random sampling, enhances the generalizability of our findings.

As we delve into the intricate fabric of mask usage among dental professionals, we anticipate uncovering nuances that could shape not only their practices but also broader strategies for combating the persistent threat of COVID-19. The subsequent sections will provide a detailed account of our methodology, sampling process, and the statistical analysis conducted using SPSS version 20. Through a meticulous examination of 300 completely filled survey forms, we aim to contribute not only to the academic discourse but, more importantly, to the safeguarding of those who tirelessly safeguard our oral health in the face of an ever-evolving viral landscape.

II. Background

The genesis of the COVID-19 pandemic in December 2019 catapulted the world into an unprecedented health crisis, challenging the resilience of healthcare systems, scientific communities, and societies at large. Originating in Wuhan, China, the novel Coronavirus, officially termed SARS-CoV-2, swiftly traversed borders, prompting the World Health Organization (WHO) to declare it a pandemic on March 11, 2020. The repercussions of this declaration reverberated across the globe, fundamentally altering the fabric of daily life and necessitating a paradigm shift in public health strategies. The impact of the pandemic transcended the mere realm of infectious diseases, cascading into multifaceted disruptions across economies, education systems, and social structures. As governments and healthcare institutions grappled with the dynamic nature of the virus, the scientific community raced to understand its nuances and devise effective countermeasures. The evolving landscape of the pandemic witnessed the emergence of multiple variants of concern, each presenting unique challenges to the ongoing efforts to curb the spread of the virus.

One such challenge arose in the form of the Omicron variant, characterized by its heightened transmissibility. In October, the discovery of the BF.7 sub-variant underscored the urgency of understanding and implementing preventive measures. This sub-variant's distinctive features, including a shorter incubation period and increased capability for reinfection, added a layer of complexity to the ongoing battle against COVID-19. In the face of these challenges, the imperative to reinforce existing preventive measures and explore new avenues for safeguarding public health became paramount. The dental community emerged as a particularly vulnerable group in the context of the pandemic. Dental care workers, by the nature of their profession, engage in close, face-to-face interactions with patients and are consistently exposed to bodily fluids, placing them at an elevated risk of infection. The upper respiratory tract, primarily affected by the coronavirus, is a focal point of their professional activities, rendering them susceptible to the virus's transmission.

In response to the heightened risk faced by dental professionals, various strategies were implemented globally. These ranged from stringent infection control protocols to the widespread adoption of personal protective equipment (PPE). Among the pantheon of preventive measures, the use of face masks gained universal acceptance. The low cost, ease of implementation, and proven efficacy in reducing the transmission of respiratory droplets made masks a

linchpin in the defense against the virus. However, the effectiveness of any preventive measure is contingent on the awareness, understanding, and adherence of the population it seeks to protect. Studies have indicated variations in the knowledge and practice of mask usage across different demographics and professions. Recognizing this variability, the present study focuses on dental professionals within a specific context—a dental college and hospital in Western Maharashtra, India.

Against this backdrop, the study aims to investigate the knowledge and practice of mask usage among dental professionals. The specific focus on this cohort is not only driven by their elevated risk of exposure but also by the need for tailored interventions that address the unique challenges posed by their professional environment. By understanding the nuances of mask usage, including procurement habits, maintenance practices, frequency of change, and disposal patterns, the study endeavors to contribute targeted insights that can inform not only the practices of dental professionals but also broader strategies for mitigating the impact of COVID-19. As we navigate the complexities of the ongoing pandemic, characterized by the persistence of known variants and the emergence of new challenges, this study stands as a beacon, shedding light on a critical aspect of preventive healthcare. The subsequent sections will expound upon the meticulous methodology employed, the sampling strategy, and the statistical analysis conducted, all aimed at unraveling the intricacies of mask usage among dental professionals in the context of the ever-evolving COVID-19 landscape.

III. Methodology

Study Design and Setting:
This study adopts a descriptive cross-sectional design and unfolds within the confines of a tertiary healthcare dental college situated in Western Maharashtra, India. The choice of a cross-sectional approach allows for a snapshot analysis of the knowledge and practices related to mask usage among dental professionals.

Ethical Considerations:
Ethical approval to conduct the study was diligently sought and obtained from the Ethics Committee of the University, ensuring adherence to ethical guidelines and the protection of participants' rights. Informed consent, a cornerstone of ethical research, was obtained from all participants. To safeguard participant anonymity, personal identifiers such as names, email IDs, and details of COVID-19 exposure were consciously omitted from data collection.

Inclusion and Exclusion Criteria:
The study targeted dental undergraduate students who were adult Indian nationals, willing to provide informed consent, and proficient in English. This focused inclusion criteria ensured a representative sample that aligns with the specific context of the study. Conversely, part-time students, alumni, and those with an inability to understand English were excluded, maintaining the homogeneity of the study population.

Sampling Technique:
To achieve a representative sample, a yearwise list of students was procured, and subjects were selected using a simple random sampling technique. This approach enhances the generalizability of findings to the broader population of dental undergraduate students in the region.

Sample size determination
A sample size of 300 was determined accordingto pilot studyThe result of pilot study showed that amongst 20 students, 75 % reported correct mask usage anddisposal.The sample size was calculated by the following formula
Sample size=$Z\alpha^2$ *(p) *(1-p)/ c^2
Where
Z= Z value (1.96 for 95%confidence level)

P=percentage of picking a choice, expressed as decimal. This was found to be 75% for the present study which was expressed as decimal as 0.75

C=confidence interval, expressed as decimal

So the sample size as calculated by the formula

Sample size=$(1.96)^2$ *(0.75) *(0.25)/ 0.05^2

Thus the sample size was calculated to be 288 and was rounded of to 300

All the students in the selected classes, present on the day of the survey, were eligible to participate, allowing for anonymous and voluntary participation. A standardized questionnaire regarding the choice, procurement, maintenance of masks, as well as practice of usage, frequency of change, and disposal was administered on the students. Reliability and validity of the questionnaire were assessed prior to the start of the study. On the day of survey 300completely filled forms were received.

Statistical analysis was conducted using SPSS version 20 (SPSS Inc., Chicago, IL, U.S.A). Descriptive statistics was used to assess all the parameters. [6].

Data Collection:

All eligible students in the selected classes, present on the day of the survey, were invited to participate. The use of a standardized questionnaire facilitated the collection of data regarding choice, procurement, maintenance, usage practices, frequency of change, and disposal of masks. Rigorous assessment of the reliability and validity of the questionnaire preceded its administration, ensuring the integrity of the data collected.

Statistical Analysis:

The amassed data underwent statistical scrutiny using SPSS version 20 (SPSS Inc., Chicago, IL, U.S.A). Descriptive statistics were employed to assess all parameters, providing a comprehensive overview of the knowledge and practices related to mask usage among the dental professional cohort.

IV. RESULTS

Demographic data

A total of 300 responses were received during the study period. The demographic profile of the Participants showed that 268 (70.3%) respondents were females, and 79 (20.7%) were males (Table 1). The average age of the sample was 22.87 years (SD = 2.7 years).

Demographic variable		N=300	Percentage
Age (in years)	18-19	20	6.66
	20-21	81	27
	22-23	149	49.66
	24-25	50	16.6
Gender	Male	79	20.7%)
	Female	268	70.3

Table 1: Demographic characteristics of the study population

Type of mask	n=300	Percentage
Cloth mask	26	8.67
Disposable Surgical mask	13	4.33
N 95 mask	82	27.634
Combination	179	59.67

Table 2: Distribution of the study participants according to the type of mask used

Regarding the choice of masks used in the present study, about one fourth of the respondents (23.67%, 71/300) reported that N95 mask was their mask of choice, while cloth mask was preferred by (7%,21/300) participants as depicted in Table 2.
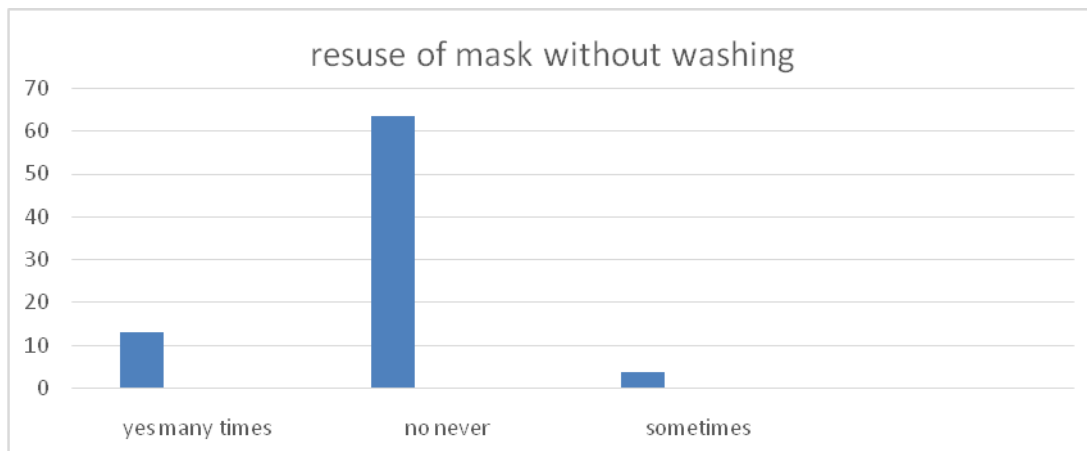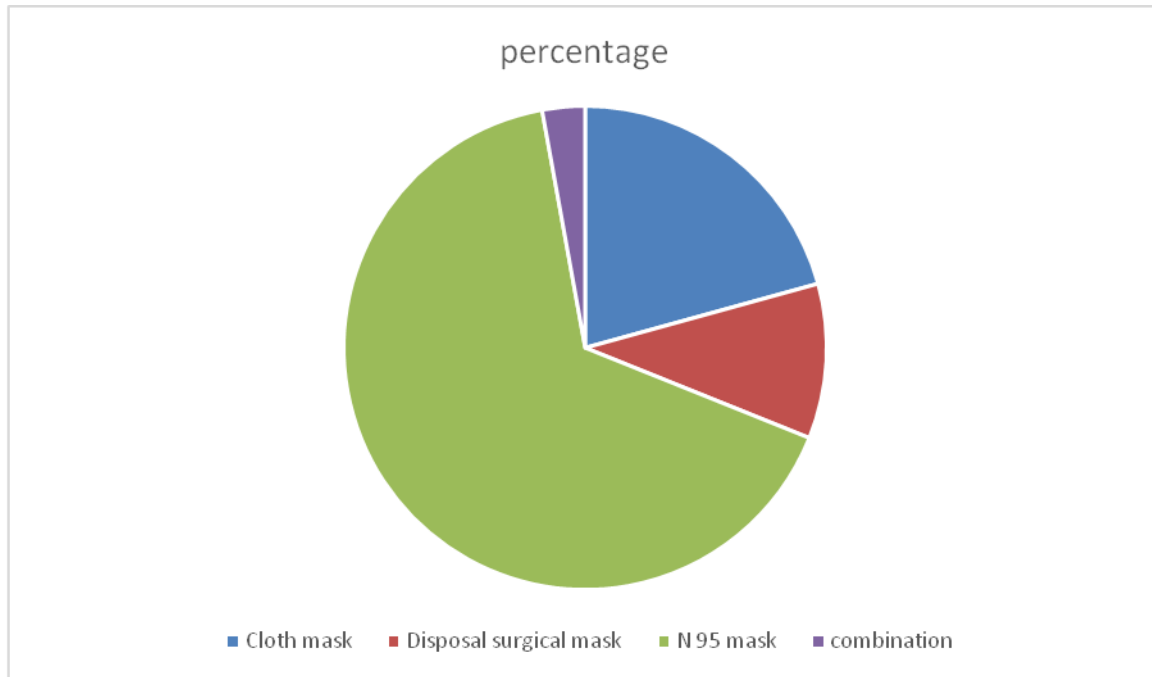
| Reuse your mask without washing	n=300	Percentage
Yes many times	39	13.00
No,never	190	63.33
Sometimes	71	23.67

Table 3: Distribution of the study participants as per mask reusage without washing

Table 3 depicts the distribution of participants in terms of mask reusage after washing. A sizeable number of the present study population (63.33%, 190/300) stated that they used mask only after washing. However (13%, 39/300) used the mask again without washing in the present study.

Skin issues	300	Percentage
Dryness	18	6.00
Itching	36	12.00
Pimple and blackheads	36	12.00
Rash	14	4.67
Swelling	4	1.33
Mixed	78	26.00
No issues	114	38.00

Table 4: Distribution of the study participants as per mask related skin issues experienced

Almost 63 % (186/300) of the study population in the present study experienced one or more skin issues since mask usage and 26 % (78/300) experienced more than one skin related symptoms as depicted in Table 4.
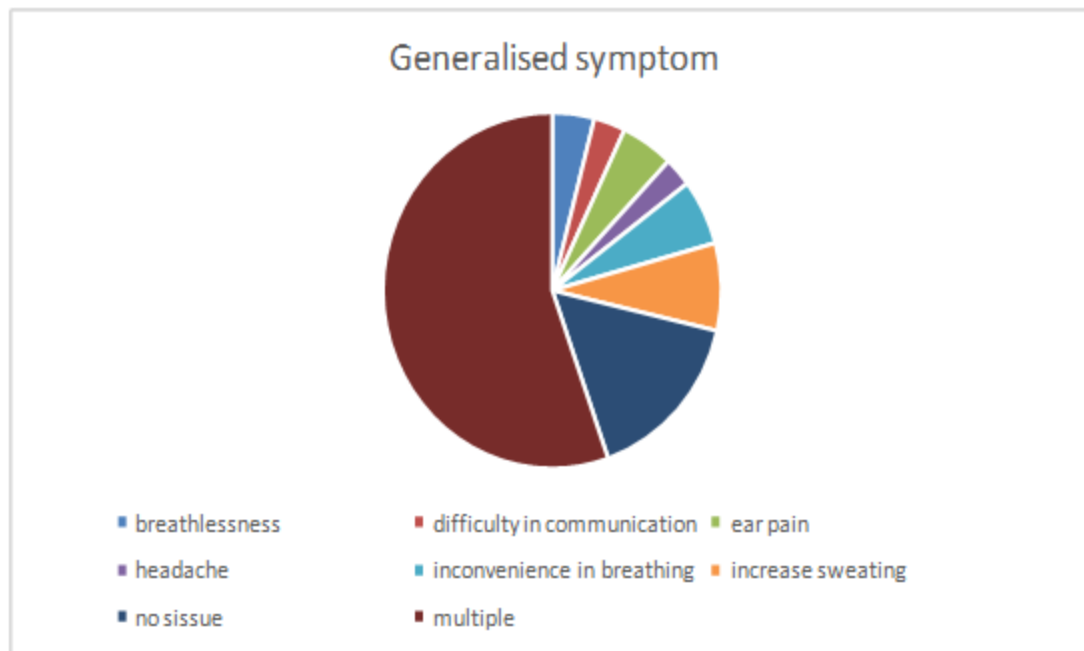
Generalised symptoms	n=300	Percentage
Breathlessness	12	4.00
Difficult in communication	9	3.00
Ear Pain	15	5.00
Headache	8	2.67
Inconvenience while wearing eyeglasses	18	6.00
Increases Sweating	24	8.00

No issues	48	16.00
Multiple	166	55.33

Table 5: Distribution of the study participants as per mask related generalized symptoms experienced

When the participants in the present study were enquired about generalized symptoms regarding mask usage, majority of the population 84% (252/300) reported to have experienced mask related symptoms including. In addition more than half of the population 55.33% (166/300) had also experience more than one symptom as shown in Table 5.

Oral Symptoms Experienced	n=300	Percentage
Bad breath	26	8.67
Bleeding Gums	2	0.67
Dry lip and dry mouth	50	16.67
Infection	2	0.67
No issues	181	60.33
Ulcers	2	0.67
Mixed	37	12.33

Table 6: Distribution of the study participants as per mask related oral symptoms   experienced

Table 6 depicts the oral symptoms experienced by the study participants where 60.33% (181/300) did not experience any of the oral symptoms. Amongst the participants who reported changes in the oral and para-oral areas, 16.67% (50/300)had dry lips and dry mouth while 8.67% (26/300)suffered from halitosis.

V.   Discussion

As India grappled with the COVID-19 pandemic, the health-care systems were reportedly battered in the face of the fierce infection. However with a consolidated approach of vaccination and preventive measures, a declining trend of the trajectory of COVID cases in India has been projected by scientists as India fights against third COVID wave occurring. The extent and severity of the third wave depend on variable factors such as the number of the vaccinated populace, maintenance of social distancing norms, evolution of the virus, and its early detection; for containment. [7].

The healthcare system has been pushed to its limits in coping with this challenge in terms of both inadequate healthcare infrastructure as well as limited trained professionals.

This has brought renewed focus on public preventive measures. Implementation of simple measures like social distancing, vaccination, isolation and washing of hands with soap; which have proved very successful in these challenging times. But probably the single most important factor contributing to the control of disease spread has been the use of masks. [5].

Choice Of Masks

The choice of masks is an important consideration regarding acceptability and compliance of practice of mask usage.

N95 masks are recommended by CDC and WHO during care of patients with highly transmissible diseases. The N in N95 stands for NIOSH, the National Institute for Occupational Safety and Health of the United States and 95 indicates filter efficiency of particles; thus, making the N95 mask 95% effective at filtering airborne particles including very small ones. When this is compared with the routinely used surgical masks which provide a barrier against large respiratory particles, it is found that they are not effective in providing protection from smaller particles. In addition, these surgical masks have an inefficient seal at the margins. [8].

The budding dental professionals in our study showed maximum preference (23.67%, 71/300) for the N95 masks followed by cloth mask (7%,21/300). These figures are comparable with the study findings of Duong MC et al amongst university students in Vietnam. They found that more than half of the study population (57.6%, 419/728) reported that a surgical mask was their most common choice for face mask, while less than one fourth of the participants preferred cloth mask (23.1%, 168/728) [9].

Surprisingly in our study a large number of participants (59.67%,179/300) practiced usage of different types of masks depending on their location and work. Similar views were echoed by Swornappan M et al in their study conducted amongst General Population in Chennai where more than one third of study participants 35(26.9%) used both cloth as well as N95 masks depending to the place and work. [10].

Reusage of mask

Maintenance of mask and its usage multiple times is a key factor in maintain the quality and optimal efficacy of mask in prevention of contamination. Majority of the students in the present study population (63.33%, 190/300) stated that they used mask only after washing. These figures are in contrast to the study by Duong, MC et al where only 28.8% (21/73) washed their masks after each use[9].Swornappan M et al also echoed similar findings in their survey of general population in Chennai, India where 37(28.5%) participants reused the disposable mask while 10(7.7%) were in doubt whether to reuse or not.[10].

Mask-induced dermatoses

The part of face under the mask has been found to be having a hot and humid environment which causes discomfort and hyperthermia to the wearer. The moist environment, pressure from tight fitting masks causes blockage of facial ducts as well as shearing and breakdown of the skin causing acne and ulcers. [11,12,13,14].

A large majority 63 % (186/300) of the participants in the present study reported suffering from one or more skin issues since mask usage and 26 % (78/300) had experienced more than one skin related symptoms. Choi SY et al in their study on mask-induced dermatoses during the COVID-19 pandemic among 12 Korean hospitals also found that out of total 330particpants, 92.73% of patients (n=306/330) reported subjective skin symptoms, with the most common being itching (66.06%), followed by stinging (31.52%)and dryness (26.36%)..[15].

Applying moisturizers, emollients, and barrier creams has been an effective counter strategy to prevent skin breakdown according to some studies. [11].

Mask related generalized symptoms

Wearing masks for an extended period of time has been known to cause physiologic and psychologic burdens and consequently deteriorate the work efficiency. Studies have shown that prolonged use of mask can lead to headache, nasal dryness, epistaxis, dryness of eyes, adverse skin reactions such as rashes, acne, and itching from mask use[12].

A majority of the population 84% (252/300)in the present study reported to have experienced mask related symptoms including headache, breathlessness, increased sweating and ear pain.

Also, multiple symptoms had been reported by more than half of the population 55.33% (166/300). These findings are similar to the digital survey done by Shubhanshu K et al, among the 300 health care workers including doctors, paramedical staff, and pharmacists during COVID-19 pandemic where headache (23%), nasal dryness (22%), eye dryness (19%), acne (12%) were the most common symptoms observed. [11].Mary AV et al in their study among dental also found that76.1% had problems breathing while wearing the mouth mask. [16].

Preventive measures like frequent use of eye lubricant drops and topical nasal saline drops or gels to prevent eye dryness and nasal dryness respectively have been recommended to prevent further ulcerations and other complications. [17,18].

To prevent headaches and impaired cognition, it has been recommended to increased hydration especially at the beginning of the shift. In addition, alternate use of surgical and N95 masks depending on the work and place while ensuring that a mask with best fit to One'S face is utilized can prove to be extremely beneficial. [11,12].

Mask related oral findings

About 39.66% (119/300) participants in the present study experienced some oral and para-oral area related pathology including dry lips and dry mouth in 16.67% (50/300) and halitosis in 8.67% (26/300).Similar findings were reported by Sachdeva S et al when they conducted a study regarding facial masks for COVID-19 pandemic awareness among health practitioners. and found that Sixty six percent participants reported oral malodor after using the facial masks while dryness of mouth was reported in 41.5%[19].

Frequent work breaks incorporated into work shifts may be an effective measure for prevention of these symptoms as it will allow for shorter duration of mask use[19].

Study Limitations

The present study recruited students from only one dental college and hospital and hence the findings cannot be extrapolated nationally. Secondly, this study only assessed the general usage of masks and did not include any question specific to this applications in dental clinics. Lastly, the cross-sectional design of this study may be associated with some degree of selection bias. In future, similar prospective studies can be designed to measure mask usage and incorporation of other safety compliance in the dental practice.

VI. Conclusions

Our study indicated that dental students had sufficient knowledge regarding the use of masks during COVID 19 pandemic. In addition, the students displayed responsible social behavior regarding usage and disposal of masks. However, in future there is a need to incorporate the details of masks and mask usage in the dental curriculum to enable these future dental professionals to minimize infection spread.

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