

# Knowledge and Awareness of the Usage and Disposal of Masks Following Various Dental Procedures among Dental Practitioners during Pandemic COVID-19

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## Abstract

**Introduction:** The risk of getting a coronavirus is getting higher now-a-days. Due to this outbreak situation masks have been recommended as a potential key to overcome this pandemic situation. A face mask is a flexible-fitting and single-use device that covers the nose, mouth and chin. It provides a barrier against potentially infectious droplets. One of the infection control measures is the routine use of face masks. Dentists are more prone to get contracted due to Face-to-face communication with the patients and also due to consistent exposure to blood and saliva which predisposes the dental care workers at a greater risk for 2019 COVID infection. Therefore, the aim of the present study is to assess the knowledge and awareness of the usage and disposal of masks following various dental procedures among dental practitioners during pandemic Covid-19. **Materials and Methods:** This cross-sectional study was conducted among dental practitioners. A set of 17 questions were asked to the participants as a survey form. A total of 100 dental practitioners were surveyed in the study. A validated semi-structure questionnaire was used to assess the knowledge, awareness, and infection control measures, such as usage of mouth masks during the pandemic COVID -19. Data was analyzed by SPSS version 23. Chi-square test was applied to measure proportion differences between several study variables among male and females, Highest level of education. **Results:** It was observed that 20.75% had answered correctly that mouth mask should be used with white side facing in (P value: 0.04), which is statistically significant; 59.09% had answered correctly that masks have three layers (P value: 0.00), which is statistically significant; 26.8% had answered correctly that masks have three layers (P value: 0.25), which is statistically significant; 28.7% had answered correctly that masks can be used for maximum of 8 hours. When it was asked which layer acts as a filter media barrier, 21.70% answered correctly (P value: 0.25), which is statistically not significant. **Conclusion:** Based on the results of the present study, it can be concluded that dental practitioners with MDS degree were found to exhibit better knowledge and awareness of the usage and disposal of masks following various dental procedures among Dental practitioners during pandemic Covid-19 when compared with dental practitioners with BDS degree.

**Keywords:** COVID-19; Cross-sectional survey; Dental practitioners; Infection control; Mouth mask; Innovative

## Introduction

In dentistry, there is constant exposure to various blood borne and upper respiratory pathogens through blood, saliva and various other body fluids. [1] Microorganisms can easily spread in closed spaces such as dental operators, where every procedure performed in the oral cavity of a patient contaminates not only the instruments used in the treatment but also that hand of the dentist and objects. [2] The main route for infection is by aerosols and splatter production, which are produced by use of aerators, micro motor hand pieces, air water syringes, and ultrasonic scales. [3] It can also be transmitted indirectly either through contaminated needle stick injury or improper handling and contact with and unsterilized instruments. [4]

Non-Pharmaceutical interventions such as usage of mouth

masks, hand washing and other hygiene measures might be effective as early control strategies. [5] Medical masks are a type of personal protective equipment used to prevent spread of respiratory infection. These masks cover the mouth and nose of the wearer and, if worn properly, maybe effective at helping prevent transmission of respiratory viruses and bacteria. Dentists are more prone to get contracted due to face-to-face communication with the patients and also due to consistent

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exposure to blood and saliva which predisposes the dental care professionals at a greater risk of COVID-19 infection. [6]

Regarding the usage of level 1, 2 and 3 masks, according to ADA-specified guidelines, level 1 masks are not widely used in dental practice, and they are appropriate only when there is no risk of blood or body splash. These can be used when conducting post-insertion reviews for removable prostheses, mouth guards and removable appliances and other performing orthodontic adjustments. [7]

Regarding the usage of level 2 masks, these are most commonly used in dental practice due to their ability to block the particle sizes commonly encountered in the dental setting or practice. These masks will block aerosols of three microns or less in size, which arises from procedures such as restorative and endodontic procedures, periodontal procedures such as the use of ultrasonic scalers and air-turbine hand pieces. Coming to the level 3 masks, these have a high level of splash protection and are used for procedures where there is a greater risk for exposure to blood and body fluids such as surgical and trauma procedures. [7,8] Our team has extensive knowledge and research experience that has translate into high quality publications. [9-28]

The aim of this study was to investigate knowledge and awareness of the usage and disposal of masks following various dental procedures among dental practitioners during pandemic COVID-19.

## Materials and Methods

### Participants

**Study design and study setting:** A descriptive cross-Sectional survey was conducted in saveetha dental college.

**Sample size estimation:** Sample size was estimated using the manual formula ( $N=Z\alpha_2 Pq/L_2$ ) based on the study done by the total sample size arrived was 100. Minimize sampling bias was done by simple random sampling. [29]

**Study population:** Study population contains 100 Dental practitioners.

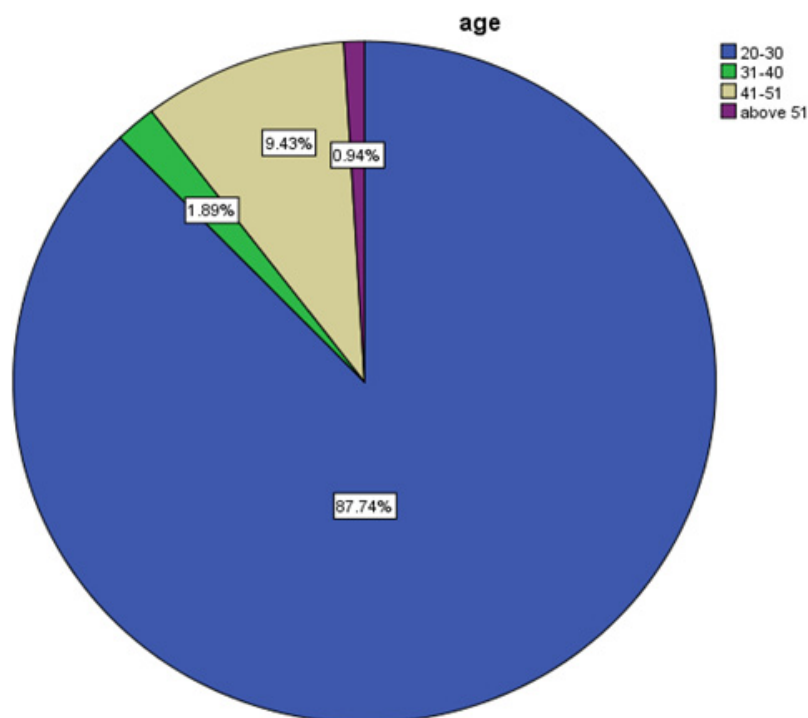
**Ethical approval:** Ethical approval was obtained from the Institutional Review Board in Saveetha University.

**Data collection:** The questionnaire contains demographic details. Other questionnaires consist of questions pertaining to knowledge, awareness, and infection control measures, such as usage of mouth masks during the pandemic COVID-19. Independent variables were age, gender, highest level of education and year of study and dependent variables were knowledge, awareness infection control measures and usage of mouth masks. Data collection can be done by means of online google survey form.

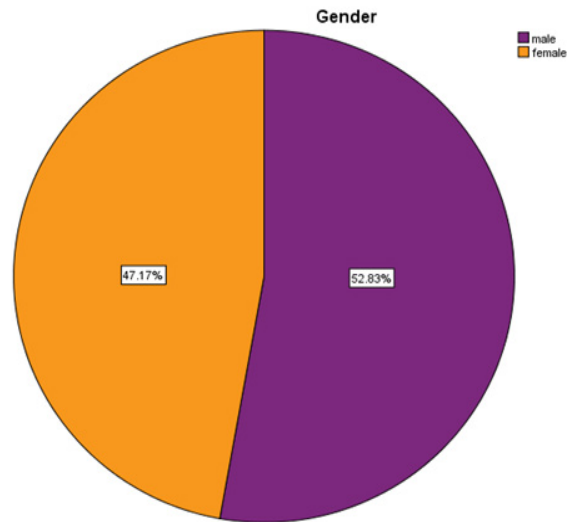
**Sampling:** Simple random sampling technique was followed.

**Statistical analysis:** Data was entered in Microsoft excel sheet after collection and was analyzed using SPSS software. Descriptive statistics were expressed by means of number, frequency, and percentage. Chi-square test was used to find the association between variables. The level of statistical significance is at  $p<0.05$ . Statistics software was Statistical Software for Social Sciences, SPSS, version 23. Independent variables were age, gender, and year of study and dependent variables were knowledge, awareness, and infection control measures **Figures 1-7.**

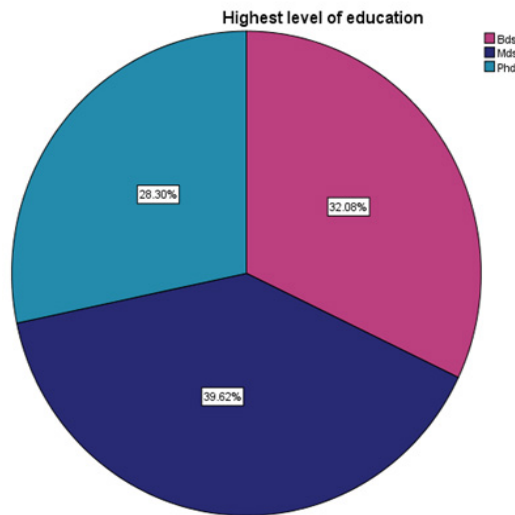
## Results



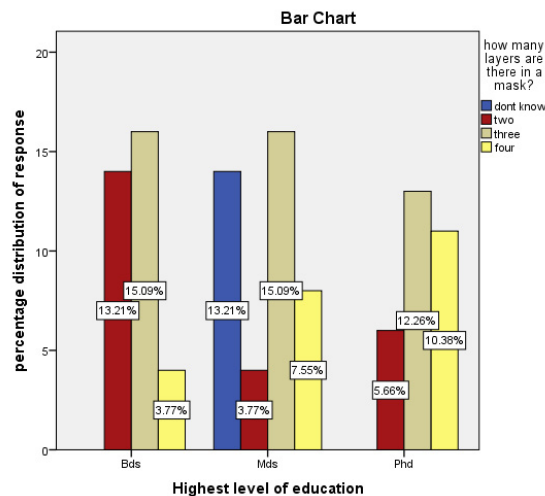
**Figure 1:** Pie chart showing percentage distribution of age of the respondents. Blue colour represents the age group 20-30 years, green colour represents the age group 30-40 years, beige colour represents age group 41-51 years of age and purple colour represents age group above the 51 years.



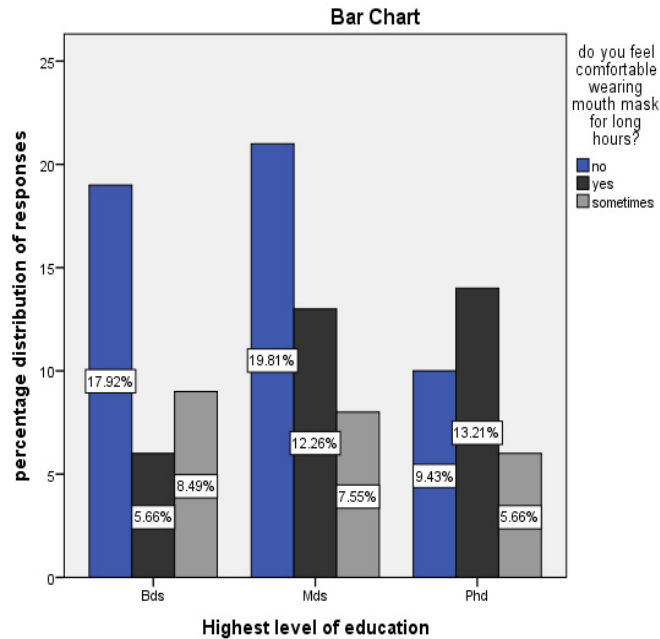
**Figure 2:** Pie chart showing percentage distribution of male and female respondents. Orange colour represents male and Dark Purple colour represents female. 47.17% were male and 52.83% were female.



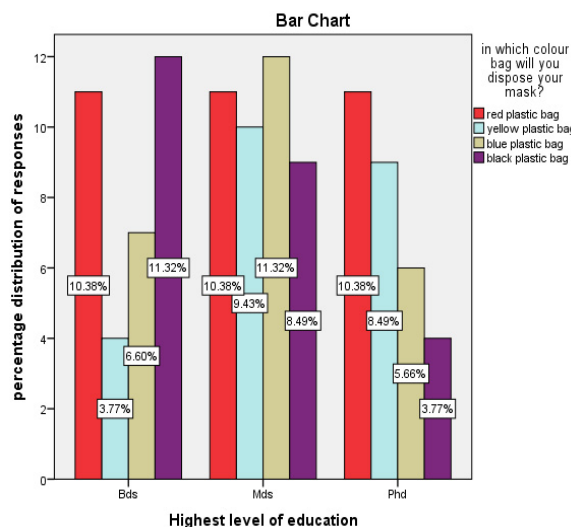
**Figure 3:** Pie chart showing percentage distribution of Highest level of education of the respondents. Rose colour represents BDS, Blue colour represents PhD, Dark Blue colour represents MDS.



**Figure 4:** Bar graph showing the association between Highest level of education and number of respondents with knowledge regarding How many layers there are in a mask. X-axis represents the Highest level of education and Y-axis represents the participants. The blue, Maroon, beige and Yellow colour bars represent the responses Don't know, Two, Three and Four respectively. 13.21% said don't know, 3.77% said Two, 15.09% said Three, 3.77% said Four among the BDS and 13.21% said don't know, 3.77% said Two, 15.09% said Three and 7.55% said Four among the MDS. 5.66% said Two, 12.26% said Three, 10.38% said Four among the PhD. Chi-square test was done (15.186, p-value: 0.004, (p<0.05)) and association was found to be statistically significant.



**Figure 5:** Bar graph showing the association between Highest level of education and number of respondents with knowledge regarding Do you feel comfortable wearing a mouth mask for long hours. X-axis represents the Highest level of education and Y-axis represents the participants. The blue, black, gray colour bars represent the responses No, Yes and Sometimes respectively. 17.92% said no, 5.66% said yes, 8.49% said sometimes among the BDS and 19.81% said no, 12.26% said yes, 7.55% said sometimes among the MDS. 9.43% said no, 13.21% said yes, 5.66% said sometimes among the PhD. Chi-square test was done (6.681, p-value: 0.154,  $p > 0.05$ ) and association was found to be statistically not significant. Majority of the MDS participants were uncomfortable wearing mouth masks for longer duration than others.



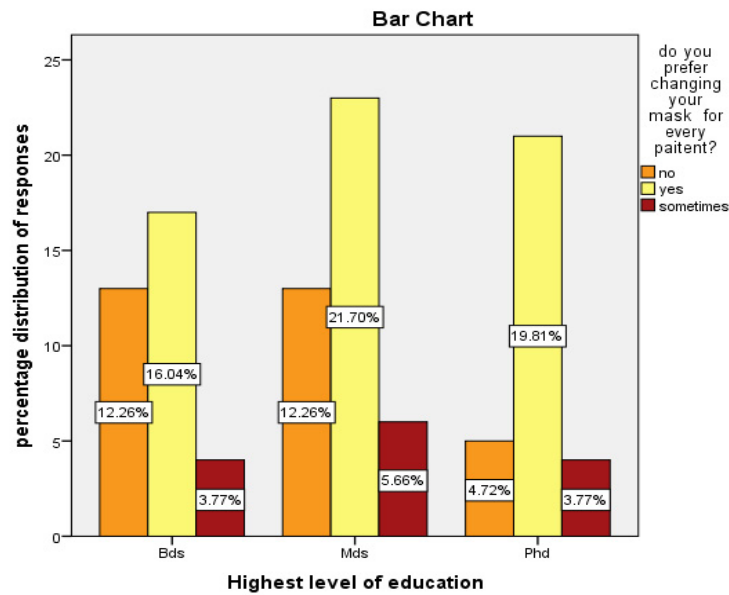
**Figure 6:** Bar graph showing the association between Highest level of education and number of respondents with knowledge regarding in which colour bag you will dispose your mask. X-axis represents the Highest level of education and Y-axis represents the participants. The red, sky blue, beige and Purple colour bars represent the responses: red plastic bag, yellow plastic bag, blue plastic bag and black plastic bag respectively. 10.38% said red plastic bag, 3.77% said yellow plastic bag, 6.60% said blue plastic bag and 11.32% said Black plastic bag among the BDS and 10.38% said red plastic bag, 9.43% said yellow plastic bag, 11.32% said blue plastic bag and 8.49% said Black plastic bag among the MDS. 10.38% said red plastic bag, 8.49% said yellow plastic bag, 5.66% said blue plastic bag and 3.77% said Black plastic bag among the PhD. Chi-square test was done (7.358, p-value: 0.289,  $p > 0.05$ ) and association was found to be statistically not significant. Although the difference was statistically not significant, MDS graduates (9.43%) were able to answer correctly than others.

## Discussion

A descriptive cross-sectional study was conducted to assess the knowledge and awareness of the usage and disposal of masks following various dental procedures among dental practitioners during pandemic COVID-19. Masks are made up of different materials and with specific designs depending on the filtering capacity. [30] Various standards are used during

evaluating the masks in the healthcare setting because the main aim of preparing the masks in the healthcare setting because the main aim of preparing the masks is to protect the wearer from infectious particles. [30,31] Masks not only protect the wearers but also protect the others by blocking the droplets ejected by the wearer while speaking and coughing. [30-32]

According to the US CDC, contact is defined as being within



**Figure 7:** Bar graph showing the association between Highest level of education and number of respondents with knowledge regarding, Do you prefer changing your mask for every patient. X-axis represents the Highest level of education and Y-axis represents the participants. The orange, yellow, maroon colour bars represent the responses No, Yes and Sometimes respectively. 12.26% said no, 16.04% said yes, 3.77% said sometimes among the BDS and 12.26% said no, 21.70% said yes, 5.66% said sometimes among the MDS. 4.72% said no, 19.81% said yes, 3.77% said sometimes among the PhD. Chi-square test was done (3.897, p-value: 0.420, (p>0.05) and association was found to be statistically not significant. Although the difference was statistically not significant, MDS graduates preferred to change their mouth masks for every patient than others.

approximately 6 feet of COVID-19 case for a prolonged period of time or having direct contact with infectious secretion of a COVID-19 case. Likewise, several additional significant explanations have been stipulated and issued by the CDC. [33]

The dental practitioners have the highest risk of potential contact with the virus because they will be having near patient interaction at some point in the healthcare setting and consequently at risk of contracting and a smattering of the Contagion. [34] A mixed response was noted about the usage of mask during the aerosol and non-aerosol generating procedures, but the maximum percentage was dental practitioners that surgical mask was used over the N95. [35] Surgical masks used for dental purposes are fluid-repellent paper filter masks, and they suitable for both surgical and nonsurgical procedures to generate aerosols. [36] Dental practitioners are more aware when compared to postgraduate it may be due to more years of experience in the clinical practice than the dental practitioners. [37] There is insufficient evidence supporting this hypothesis because along with the usage of masks, hand hygiene and infection control protocol should be followed, which may help to prevent disease transmission. [37,38]

In this study 61.7% of the population answered that they usually changed their mouth mask after every patient but still there were nearly 40% who did not change their mouth mask after completing a patient. A step towards to protect themselves from infection should always be a part of the practice and it should be changed because there are changes for a next patient to get infected by the previously used mouth mask for a patient to get infected by not only the patients but also the dentist could get infected. So, these kinds of practice should soon be implemented by all of the practitioners to dispose the mask after completing patient. [39] 22.1% had answered while exam while examination

they did not prefer using other treatments during which they did not feel it necessary to wear a mask like during hand scaling and restorations. It is recommended that the mouth mask should be worn by the dentist for every treatment procedure and during every treatment. [33]

## Conclusion

Based on the results of the present study, it can be concluded that dental practitioners with MDS degree were found to exhibit better knowledge and awareness of the usage and disposal of masks following various dental procedures among Dental practitioners during pandemic Covid-19 when compared with dental practitioners with BDS degree.

## Acknowledgment

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## Conflict of Interest

All the authors declare that there was no conflict of interest in the present study.

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