

To Evaluate Impact of the Severe Acute Respiratory Syndrome Coronavirus 2 Virus on the Dental Practice in Maharashtra: A Cross-Sectional Survey

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Abstract

Background: Due to the highly infectious nature of the virus, many medical institutions are forced to stop all routine operations to reduce the risk of spreading the infection. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is highly contagious, too the fact that dental procedures often produce blood and saliva droplets that lead to the spread of the virus. The scenario is, in practice, it is a very complex task. **Materials and Methods:** This report is based on a questionnaire that was conducted among dentists in Maharashtra, India. The survey included questions that evaluate the dentists' perceptions and attitudes toward the SARS-COV-2 and its effect on their personal life, financial status, and the quality of dental services for the patients. **Results:** The majority of the participants did not perform non-emergency procedures during the SARS-CoV-2 virus infection. The dental practitioners have suggested several strategies to decrease the risk of contagion. However, most of the dentists had problems, providing personal protective equipment during the pandemic. Participants reported that they encountered a decrease in their financial income since the eruption of the SARS-CoV-2 virus infection. **Conclusion:** Statewide sample of dentists Maharashtra had a substantial knowledge and was aware of symptoms, mode of transmission, and infection control regarding coronavirus disease 2019. During the curfew, most dentists followed the recommendations to provide emergency or limited services.

Keywords: Coronavirus disease 2019, Dental practice, Severe acute respiratory syndrome coronavirus 2.

INTRODUCTION

In December 2019, an outbreak of the new 2019 beta-coronavirus disease 2019 (COVID-19) began in Wuhan, China, in Hubei Province. Now, the virus has spread all over the world and worries all aspects of human life.^[1] Symptoms of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) are similar to those of known coronavirus infections. These include fever, dry cough, and fatigue, but acute respiratory viral infections coronavirus 2 (ARVI-COV-2) has a higher animal dispersion.^[2] The virus can spread through respiratory droplets and impure surfaces, that is, through the mucous membranes of the mouth, eyes, and nose, as well as by fecal-oral route.^[3,4] Due to the highly infectious nature of the virus, many medical institutions are forced to stop all routine operations to reduce the risk of spreading the infection. The use of hand pieces and ultrasound instruments in dental practice will inevitably lead to the formation of drops of blood and saliva.^[5] Therefore, these drops can contaminate dental instruments and the environment. Therefore, dentists and

patients may be at risk of infection, they are microorganisms of the party.^[6,7]

In this regard, the researchers mean that dental clinics can be a source of transmission of viruses such as the human immune deficiency virus and hepatitis B virus; these germs could have passed during the dental practice in patients and staff.^[8,9] SARS-CoV2 is highly contagious, too the fact that dental procedures often produce blood and saliva droplets that lead to the spread of the virus followed by the American Dental Association (ADA) suggesting that dentists limit their interventions emergency

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treatment.^[10] In addition, strict precautionary measures should be put in place during the epidemic until reduce the risk of infection. For example, dentists as well their assistants should always provide before the procedure cleanses patients and often protects against germs dental implants.^[11] In addition, it reduces the risk spit table top ejectors, anti-return equipment, rubber dam partition, and your own protective materials personal protective equipment (PPE) should be used.^[11,12] Closure of dental clinics due to COVID-19 epidemic disrupted dental services for patients. In addition, the Irish Dental Association stated that approximately 75% of dentists expect financial losses of more than 70% during an outbreak.^[13] Otherwise, it has been said that dentists are possible infected with the SARS-CoV-2 virus, undetected, too become carriers of the virus.^[14] As a result, the teeth services were limited to emergencies and emergencies in the early days of the plague.^[15]

The asymptomatic incubation period of the virus has been estimated to be between 2 and 12 days, although some studies have reported an incubation period of up to 24 days. The SARS-CoV 2 virus remain on the surface for a long period of time (from several hours to several days), depending on the ambient temperature, humidity, and type of material of the surface. (eg iron, gold etc). Therefore, the use of appropriate and effective dental disinfection controls in the settings, it cannot be stressed enough. In addition, the dental staff should wear PPE in the prevention of infection in symptomatic and asymptomatic patients.^[16]

To control the infection in the dental clinic, the World Health Organization, the Centers for Disease Control and Prevention (CDC), and the ADA are fast becoming a published guidelines for the profession of dentistry and have been updated regularly ever since.^[3,5] In addition, it has been a number of reports that provide useful information on the signs and symptoms of COVID-19, and possible transfer routes, mechanisms, and may refer the patient to an improvement in the knowledge and practice of preventive dentists.^[17]

Studies have shown that a large respiratory droplets with a diameter $>10\ \mu$ can be transferred from an infected person, and then navigate to a height of up to 6 m, while the cough is moving with a velocity of 10 m/s, and sneezing all the time, with a speed of 50 m/s. In addition, the spray head, including the drop of the atomic nuclei, can remain in the air for a long period of time, and the small particle size of $0.5\text{--}10\ \mu$ in size that can penetrate and remain in the airways to the alveolar space. Aerosol particles have been found to remain in the air for up to 30 min after the dental procedures are completed. Anyone WHO acknowledges that this is an experiment was carried out under the terms and conditions that are sure to induce a cough and clinical settings. These differences highlight the need for further research to accurately assess the cost-effectiveness of the SARS-CoV-2, during and after dental procedures. The SARS-CoV-2, with an average size of $0.125\ \mu$, and an average incubation period is 5–6 days of exposure, with symptoms ranging from 2 to 14 days and to create, from asymptomatic carriers of the greatest threats to comprehend.^[17,18]

Unfortunately, the COVID-19 pandemic, it will not be instantly and to everyone's faces for a very long time, work, and social recovery of the population. At this point, the vast majority of the people opt to avoid dental treatment, except for the ones who feel pain, or mergers and acquisitions, due to the monetary issues, and, above all, a psychological cause, thus it won't be easy to beat the fear of infection.^[1,18] The practice is a source of potential infection, taking into account that the first person is in danger, it is also a dentist. The scenario is, in practice, it is a very complex task, and there are a number of problems, which could be dangerous for a dental practice. The concern about the transmission of the coronavirus in a dental practice, it is generally recognized throughout the world.

Therefore, the aim of the study is to evaluate impact of the SARS-CoV-2 virus on the dental practice in Maharashtra: A cross-sectional survey.

MATERIALS AND METHODS

Study design

This report is based on a questionnaire conducted from April 1, 2021, to April 30, 2021, among dentists. The total number of dentists in Maharashtra was estimated to be 12,000 that work in public, private, and non-profit organizations. We conducted the chain-referral sampling method as most of the participants were hard to find. Our study population consists of specialists and general dentists who work in Maharashtra of their city and workplace. We asked the dentists to participate in the study through the internet (social media) and asked them to distribute the survey among the other colleagues at their convenience. The newly draft of the questionnaire was designed for the present study based on experts' opinions. A new designed questionnaire was used to assess Maharashtra dentists about impact of second wave COVID-19 on their dental practice.

Selection criteria

Inclusion criteria

The following criteria were included in the study:

1. Dentists who had completed BDS degree
2. Dentists willing to give informed consent for participation in study
3. Dentists practicing in Maharashtra
4. Dentists practicing in private clinics.

Exclusion criteria

The following criteria were excluded from the study:

1. Participants without a BDS degree
2. Participants unwilling to give informed consent for participation in study
3. Dentists practicing outside of Maharashtra
4. Other dentists who do not work in private clinics.

Setting, participants, and sample size

Our study population consisted of dentists that are completed their bachelor degree or master degree and work in Maharashtra. Sample size was calculated from the previous study.

Data sources and variables

We used newly formed questionnaire-based survey in English language in this study. The survey comprised a series of multiple-choice questions with dentist demographic and profession-related characteristics of the dentist's general knowledge and attitude regarding COVID-19, as well as attitudes and perceptions toward the disease with a special focus on impact of second wave COVID-19 on dental practice. The questions were developed after reviewing relevant literature and existing international guidelines. The first version of the questionnaire was piloted among 20 dentists and one statistician to ensure suitability and practicability. After specifying the research question, the focus of the inclusion criteria related to the nature of published SARS-CoV-2 or COVID-19 information, with a special focus on the dental profession. The criteria thus searched for, related to infection control and disinfection measures, transmission of SARS-CoV-2 infections and the set ethical principles associated with treating dental patients and managing dental staff.

The survey was made available to all registered dentists in Dental Council of India. The generated link was shared through mail, and social media inviting all members to take part in this survey. Only fully completed questionnaires were considered. The data obtained were absolutely anonymous, and tracing the identity of the dentists was not possible. The survey data were gathered from April 1, 2021 to April 30, 2021.

Statistical methods

Descriptive statistics were used to summarize and analyze the data. Absolute and relative frequencies as well as measures of central tendency and dispersion were calculated as appropriate, depending on the scale level and distribution of each variable. Furthermore, the Chi-square test was used to find any significant association between the parameters, and $P < 0.05$ was considered as statistically significant. The calculation was performed using Statistical Package for the Social Sciences version 22.0 software.

RESULTS

Table 1 shows demographic detail of the study participants. About 45% of study participants was 25–35 years, 32% was 36–45 years, and 33 study participants was more than 45 years. About 48% have <10 years, 40% have 10–20 years, and 12% of study participants have more than 20 years of experience.

In the present study, 39% was male and 61% of study participants were female. About 23% of study participants work in private sector, 7% were in government sector, and 70% study participants have their own private dental clinic.

Table 2 shows

1. 88% of study participants felt that dentists are at higher risk of contracting COVID-19 than any other health care workers
2. 73% of study participants felt that he/she might be a major cause of transmitting the infection to your patients

3. 59% of study participants felt safe practicing dentistry in the COVID-19 second mutant
4. 30% of dentist clinic patient flow was affected due to the second mutant
5. Due to the second mutant, 47% of dentist working for lesser clinical hours per day
6. 91% of dentists have affected their daily monetary income through dentistry due to second mutant.

Table 3 shows

1. 45% have changed treatment due to second mutant of COVID-19 virus?
2. 30% canceled all treatment until the end of the alert phase of the double mutant COVID-19 virus?
3. 14% do not perform any non-emergency treatment after double mutant COVID-19 virus
4. 72% of dentists limited the practice to the urgent and emergent cases
5. 96% have been implementing the latest guidelines during the practice
6. 58% feel stress due to second mutant
7. 65% feel economical problem due to the second mutant.

Table 1: Demographic details of study participants

Age	
25–35	45
36–45	32
More than 45	33
Gender	
Male	39
Female	61
Experience	
<10 years	48
10–20 years	40
More than 20	12
Job setting	
Private	23
Government	7
clinic	70

Table 2: Impact of covid 19 on dental practice

Questions	Yes (%)	No (%)
Do you felt that dentists are at higher risk of contracting COVID-19 than any other health care workers	88	12
Do you felt that you might be a major cause of transmitting the infection to your patients	73	27
Do you felt safe practicing dentistry in the COVID-19 second mutant	59	41
Did patient flow was affected due to the second mutant	30	70
Did you reduce clinical hours per day due to the second mutant	47	53
Have affected your daily monetary income through dentistry due to second mutant	91	9

COVID-19: Coronavirus disease 2019

DISCUSSION

The results of the study showed that many of the dentists, experiencing symptoms of COVID-19, and many of them have tested positive for COVID-19. In addition, the dental clinic staffs are also a significant risk of infection, as in our study, it showed that the wizards have had the symptoms described above. This means that your dental practice, you should be even more careful, infection control, and non-emergency treatment must be deferred until the end of the pandemic.^[19] Nosocomial transmission of SARS-CoV-2, it has been a concern to practitioners, as it can be for both patients and dentists are at risk of infection.^[20] As mentioned in the previous studies, the dentists are at high risk of contracting SARS-CoV-2.^[21-23]

The majority of the participants in this study, showed a significant increase in the demand for remote dental consultation. However, they are treated as external consultation is an effective way to get the dental services provided. We believe that these results may be due to the peculiarities of the dental procedures, and the lack of appropriate infrastructure. Further research needs to be carried out to predict the development of state of the art technology that is practical and can provide dental services.^[24] The Occupational Health and Safety Administration pointed out that the use of the remote dental consultation should be considered for non-emergent cases during the pandemic.^[25] In addition, before the current pandemic, consultations, it was declared to be of a high enough quality for the oral treatment.^[26] The tele-health-based delivery of dental services seems to be an attractive and flexible concept, especially during these unprecedented times.^[27] In spite of this, the majority of hospitals do not have the right equipment, such as network infrastructure, and the training of personnel to provide telemedicine services.^[23] A large number of the participants said that they would not be performing any non-urgent procedures and reduced their working hours to minimize the spread of the virus. They also said that they will comply with and implement the latest national and international guidelines on COVID-19 for the dental practice. We believe, however, that the detailed guidelines for the dental equipment

shall be provided in all over the world to be effective and to minimize the risk of infection. In the second mutant, several organizations, including the Centers for CDC, the ADA, the British Dental Association, and the National Health Service, have been developed and implemented in a taskforce, and the user guide for the dental plants.^[10,28,29] In these instructions, you will have a special focus will be devoted to a careful examination of the patient, taking into account, the clinical signs and the medical history of the disease.^[23] In the early days of the pandemic, the guidelines are also recommended for all dental procedures that need to be implemented for the emergency diagnosis and provide adequate personal protective measures, and make sure the patient.^[4] In our study, several suggestions have been made to reduce the risk of infection, such as lowering the costs of the treatment, with an emphasis on preventive care, triaging patients, and additional symptoms, and the execution of COVID-19 clinical trials for these patients, and the use of appropriate PPE. According to some participants, the reopening of the dental clinics in the cases which are not related to emergency situations, it can lead to an increase in the incidence of COVID-19, as well as dental offices will be closed until the end of the pandemic. Public sector organizations have suggested that the inhabitants, generally, to improve the oral hygiene and preventive care to reduce the demand for dental care during the pandemic.^[23] Since most of the dental clinics have a low-risk surgeries and procedures, such as tooth extraction, as this may increase the demand for the implants in the future.^[30] However, if the pandemic continued, it was suggested that the unit may also be a sign of a non-emergency treatment.

In a survey conducted by the ADA Institute for Health Policy found that more than 90% of all dental clinics are currently open for regular medical care.^[31] The CDC has also developed a standard for the health-care system and health-care providers for the provision of non-emergency services, to minimize the risk of infection.^[32] The effective use of PPE, including dressing gowns, gloves, face shields, safety glasses or goggles, and a face mask, is an important regulatory factor to prevent the spread of the virus among health care workers and patients.^[33,34] Whereas a significant increase in the demand for PPE has led to a shortage of supplies around the world due to increase use of PPE kit in clinics and other field.^[35] The majority of the participants in this study claimed to be the PPE consumption increased considerably, and more than half of them had a hard time finding a face mask, after the second of Instagram COVID-19 outbreak. In addition, he said, is that the prices are for the PPE were significantly increased, which may be a sign of a deficiency. The increase in PPE and prices may also lead to an increase in the cost of the treatment.^[23]

A large number of the participants had financial problems due to reduced working hours and be limited to dental procedures. Consistently, studies have shown that the COVID-19 pandemic has led to a financial crisis in the dental offices.^[36] More than half of the dentists are spending their life savings on the day-to-day expenses. However, a small number of them

Table 3: Economic impact of covid 19 on dental practice

Question	Yes (%)	No (%)
Have changed treatment due to second mutant of COVID-19 virus?	45	55
Canceled all treatment until the end of the alert phase of the double mutant COVID-19 virus	30	70
Do not perform any non-emergency treatment after double mutant COVID-19 virus	14	86
Have you limited the practice to the urgent and emergent cases	72	28
Have you implementing the latest guidelines during the practice	96	4
Have you feel stress due to second mutant	58	42
Have you feel economical problem due to second mutant	65	35

COVID-19: Coronavirus disease 2019

have received financial assistance from non-governmental organizations. These findings suggest that organizations need to support our efforts to fund the dentists and their assistants, in these unprecedented times. If there are no funds have been allocated to support the dental staff, the maintenance of the COVID-19 pandemic and the number of employees in financial difficulty will be increased.^[23] Our study also found that about half of the participants had symptoms of depression and anxiety. It has been found that the health of the employees will experience a lot more stress in comparison with that of the general population during the COVID-19 pandemic.^[37,38] The increased work pressure, work in the ever-changing rules and regulations, the use of PPE, social distance, self-isolation, and for the care and supervision of a worsening of the patient are the most important concerns of health-care personnel during a global pandemic.^[39,40] In addition to the difficult decisions that must be made to the design of a pandemic, since the resources are limited.^[41]

Our study has several limitations. One of the main drawbacks of our study is the discretization method. While it took a chain that can be selected are an easy and quick way to get the participants, they can opt-out of the study after receiving an invitation. In addition, it may be that the participants recommend that the dentist you will learn about in the same age group. This research is a descriptive research that is focused on the descriptive analysis of everyday situations and objects, so it is unable to verify or test the causal relationships. Another weakness of our study is that we had a limited amount of time available for the implementation of the survey to be more substantial.

CONCLUSION

Based on statewide sample of dentists, Maharashtra had a substantial knowledge and were aware of symptoms, mode of transmission, and infection control regarding COVID-19. During the curfew, most dentists followed the recommendations to provide emergency or limited services. Nevertheless, further studies with a much larger sample size and longer follow-up period are needed to achieve more precise results regarding the long-term implications of COVID-19 on dentists.

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