



**IMPACT OF COVID-19 ON DENTAL PRACTICE AND PRACTITIONERS IN INDIA – A  
CROSS SECTIONAL ONLINE SURVEY**

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**ABSTRACT**

**Introduction:** Corona virus disease is an ongoing global pandemic influencing every aspect of life. Healthcare professionals are at a higher risk of getting infected, especially dentists, as they work in close proximity to patient's mouth. This pandemic has put enormous pressure on both private dental practitioners and the already-struggling public oral health care system. Therefore, the aim of the survey is to determine the impact of COVID-19 in dental practice. **Materials and Methods:** A cross sectional survey was conducted among 247 dental practitioners using Google forms. **Results:** The results showed that 192 respondents were continuing to practice whereas the rest suspended practice due to fear and other reasons. They admitted difficulties in getting materials, high rate of negative influences in professional activity, and fear for professional future. It was reported that governmental aids could help in current situation. **Conclusion:** Dentists are heavily impacted by the current crisis.

**KEYWORDS:** COVID-19, Dental Practice, India, Online survey.

**INTRODUCTION**

Corona virus disease (COVID-19) is an ongoing global pandemic influencing every aspect of life. The first reported case was in Wuhan, China which later spread worldwide. World Health Organisation (WHO), in February 2020, named the latest strain of corona virus as COVID - 19 and declared it as a pandemic on 11- March - 2020. According to the data released by WHO, until 18 June 2020, COVID-19 has affected close to 200 countries with a total of 23,618,607 confirmed cases and 813,110 deaths worldwide.<sup>[1, 2]</sup>

Corona viruses (CoVs) are among the major pathogens which primarily target the human respiratory system. Earlier outbreaks of corona viruses include severe acute respiratory syndrome (SARS)-CoV and middle east respiratory syndrome (MERS)-CoV which have been categorized as a great public health threat. COVID-19 caused by SARS CoV2 has the potential to cause severe acute respiratory tract infection among infected humans and is commonly transmitted from person to person via hands, saliva, nasal droplets and fomites. Airborne contamination is due to droplets released through exhalation, cough or sneeze. The average incubation

period is 2 weeks though it may be as early as 2 days with the following clinical manifestations: high grade fever, dyspnea, dry cough, anosmia, ageusia and in few cases, diarrhea.<sup>[3-6]</sup>

Owing to the nature of the outbreak, restrictions have been imposed on social gatherings, educational institutions, public transportations, work places, which includes complete shut-down to various degrees of relaxations. Though it can be managed without these services, health care is a basic need, hence rarely closed. Healthcare professionals on the other hand are at a higher risk of getting infected. Dentists are at the top in the infection susceptibility chart as they work in close proximity to patient's mouth exposing themselves to patient's blood, saliva, breathing, etc., Therefore in dental practice, possible routes of transmission includes airborne spread (through aerosols generated during dental procedure), contact spread, and contaminated surface spread. A study conducted in the place of origin suggests that despite the use of protective measures such as masks & gloves, several dental staff members in Wuhan were found to have been infected with COVID-19. Moreover recent data suggests not only

patients with symptomatic COVID-19 act as a source of transmission but asymptomatic cases and those cases in its incubation phase were also actively transmitting the virus.<sup>[7-9]</sup>

Considering the fact that dentists have a higher risk of getting infected from patients and potentially spreading it to their family, peers & other patients and since WHO's declaration of COVID-19 as pandemic, dental authorities worldwide have recommended dental clinics to treat only emergency cases. In addition, several studies have offered different recommendations for infection control protocols to be followed in dental practice. Ministry of health (MoH) and Dental Council of India (DCI), the governing bodies in India, have also provided protocols and guidelines to be adopted by dental clinics. The most significant modification required includes implementation of enhanced personal protective equipment (PPE) such as filtering face piece respirators, disposable fluid resistant gowns, airtight eye protection and full face shields. This pandemic has put an enormous pressure on both private dental practitioners and the already-struggling public oral health care system due to implementation of new protocols, shortages and usage of enhanced PPE, economic implications and the general anxiety fueled by inconsistent information about the COVID-19 pandemic. Majority of dental practitioners have voluntarily decided to suspend their clinical practice in order to mitigate the spread of the disease.<sup>[10-12]</sup> The aim of this cross-sectional online questionnaire survey was to assess the impact of COVID-19 on dental practitioners in their clinical practice.

## METHODOLOGY

A cross-sectional online survey was conducted among (n=247) dental practitioners. Ethical approval was obtained from Institutional review board, Best Dental Science College and Hospital, Madurai. The questionnaire was in English, adopted from a study conducted in Italy and certain adaptations were made taking into consideration, the appropriateness of the content for the Indian scenario. The validity of the questionnaire was tested for face validity by the panel of experts and modified in accordance with their recommendations to ensure comprehensive ability. A pilot study was carried out among 10 subjects to test for items' understandability and content validity of the questionnaire. Questions with content validity ratio >0.60 were included in the study. Data collected from these participants were used to make final refinements to the questionnaire. The levels of missing data was used as an indicator of inappropriate questions and those questions were reframed accordingly.<sup>[13]</sup>

A total of 400 dental practitioners in India were approached, out of which 255 responses were obtained. Of the 255 responses, 247 agreed to participate in the survey. The questionnaire comprised of 20 item

pre-tested, and validated questions (Table 1). The questions were closed ended with the provision to choose only one option per question except for questions regarding professional setup and aids that could help during & after COVID-19 (item number 5, 19, 20). The tool used to generate the questionnaire was Google<sup>®</sup> forms (Google LLC, US). The online questionnaire link was sent through electronic mail and other social media from 01 August 2020 to 15 August 2020 to dental professionals, whose contact details were collected from various associations and groups. The purpose of the study was described and consent for participation was obtained prior to their participation in the survey. The participants who agreed to participate in the survey were guided through the survey questions. The questionnaire included demographic data such as name, age, email-id and gender. Name and e mail-id were not made mandatory to aid in providing an option for the participants to maintain anonymity, all other questions were mandatory. Only those who answered all the questions received the option to submit the form. After collecting the demographic details, the questionnaire comprised of a question in its first section asking details about their current practice; whether they are continuing practice or have discontinued and the reasons for doing so. Those who are continuing practice were guided for the second section and those who have discontinued practice were only asked for reasons for discontinuation and were allowed to submit the forms as the other section is not applicable for them.

**Table 1a: Survey consist of 20 questions in order to assess the impact of COVID-19 in dental practice under 2 sections; Section 1 comprises of demographic details and questions related to clinical practice.**

Age	<30 years 30 - 40 years 40 - 50 years > 50 years
Gender	Male Female
Area of Dental Practice	Rural Urban
Years of Professional experience	0 - 5 years 6- 10 years 11 - 15 years > 15 years
Professional setting	Owner/Partner of private practice Employed in private practice Employed in educational institution Employed in government firms Others
What makes you continue clinical practice?	The needs of my patients I don't want to lose my patients I have good personal protective equipment Financial reasons I am not practicing Others
If not practicing, Reasons for not practicing	I fear for my health and life I fear for the health and life of the members of my family I work in insufficiently equipped dental office My financial situation allows me to suspend my clinical work Patients cancelled their appointments because they are afraid of contracting COVID19 The dental office where am employed is closed Others

**Table 1b: Survey consist of 20 questions in order to assess the impact of COVID-19 in dental practice under 2 sections; Section 2 comprises of questions to assess the impact of COVID-19 on dental practice and practitioners.**

7. Average working hours per day before COVID-19	<5 5 - 10 >10
8. Average working hours per day currently due to COVID-19	<5 5 - 10 >10
9. Do patients cancel previously taken appointments more often than before in recent times?	Yes No
10. Did COVID-19 pandemic condition negatively influenced your professional activity?	Not at all Little Quite a lot Extremely
11. Have you modified the choice of personal protective equipment due to COVID19 as per guidelines?	Yes No
12. How much of investment have you or your employer made due to COVID-19 for personal protective equipment and infection control?	≤10,000 11,000 - 25,000 26,000 - 50,000 ≥51,000 None
13. Do you face difficulty in getting personal protective equipment?	Yes No I don't know
14. Since the beginning of the pandemic have you noticed delays in the delivery timing of dental materials?	Yes No

	I don't know
15. Have you increased the cost of care provided due to COVID-19; do you think that patients are willing to afford even if the costs are hiked?	Yes; Yes No; No Yes; No No; Yes
16. How worried are you about contracting COVID-19 during clinical activity?	Not at all Little Quite a lot Extremely worried
17. How worried are you for your professional future?	Not at all Little Quite a lot Extremely worried
18. What worries you the most?	I don't know when this emergency situation will end Patients will have less money to spend The crisis of dental environment will get worse The need of new procedure and new device for safety and infection procedure The chance of losing my job or having to fire my employees Others
19. Which aids do you think could help dental professionals DURING COVID-19 pandemic?	Economic relief from Government Improvement of communication with patients Economic reliefs from dental associations Bank support Tax exempted health care supplies Others
20. Which aids do you think could help dental professionals AFTER COVID-19 pandemic?	Economic relief from Government Improvement of communication with patients Economic reliefs from dental associations Bank support Tax exempted health care supplies Others

## RESULT

A total of 255 submissions were recorded, of which 247 agreed to participate, whose data were available and included in the analysis. The demographic characteristics and details on practice of the study participants are mentioned in table 2. Of the respondents 55.9% were male and 44.1% were female. The majority of

participants were aged <30 years (57.1%) and most had been working in urban areas (63.6%) than rural. Of the total responses, 56.7%, 18.2%, 14.6%, and 10.5% of them had clinical experience of 0-5 years, 6 – 10 years, 11-15 years, and more than 15 years of clinical experience, respectively. The majority of the responders were owners/partners in private practice (47.8%).

**Table 2: Demographic information of dental practitioners and details on continuation or discontinuation of clinical practice.**

VARIABLE	CHARACTERSTICS	POPULATION(%)
Gender	Male	138 (55.9%)
	Female	109 (44.1%)
Age	<30 years	141 (57.1%)
	30 - 40 years	73 (29.6%)
	40 - 50 years	25 (10.1%)
	> 50 years	8 (3.2%)
Area of Dental Practice	Rural	90 (36.4%)
	Urban	157 (63.6%)
Years of Professional experience	0 - 5 years	140 (56.7%)
	6- 10 years	45 (18.2%)
	11 - 15 years	36 (14.6%)
	> 15 years	26 (10.5%)
Professional setting	Owner/Partner of private practice	118 (47.8%)
	Employed in private practice	73 (29.6%)
	Employed in educational institution	43 (17.4%)
	Employed in government firms	8 (3.4%)
	Others	24 (9.7%)

Of the 247 responses, to the question pertaining to the continuation of dental practice amidst the COVID-19 pandemic, 55 respondents (22.3%) stated that they were not practicing and the reasons were; due to the fear of the health of life of the members of their family (30.9%), due to closure of dental office where they were employed (29.1%) and due to insufficiently equipped dental office (12.7%).

A total of 192 participants (87.7%) continued their practice and attributed the following reasons for their continuation of dental practice though a majority stated to continue for the needs of their patients. [Figure.1]

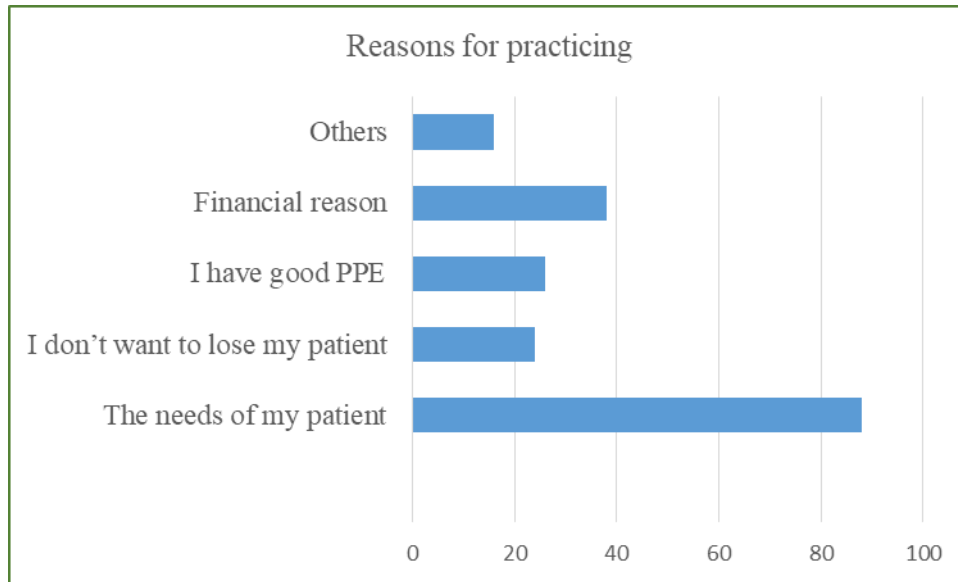


Figure 1: Reasons for practicing during pandemic.

Majority of the dentists (67.2%) were working for 5-10 hours before pandemic but during the pandemic, 78.1% work for less than 5 hours per day. Earlier, 17.7% of them were practicing for more than 10 hours per day but during the pandemic, only 3.6% of them are practicing for more than 10 hours. A high percentage of patients have cancelled their previously taken appointments (69.8%). The negative influence of pandemic on professional activity was agreed to be quite a lot by 43.2% of the respondents. The practitioners also admitted that 95.3% had modified their PPEs while 42.2% increased their investments in equipment up to

Rupees 11,000 - 25,000; 32.8% less than Rs.10,000 and 16.7% more than Rs.51,000. Almost half of the respondents (51.6%) reported difficulties in obtaining PPE, and 79.2% reported problems in the delivery time of dental materials. As a result it was found that 62% of the practitioners have hiked the cost of treatments but 68.2% of dentists felt patients were unwilling to afford if costs are raised.

Dentists were concerned about their susceptibility to contract COVID-19 during their clinical activity and their professional future (Table.3)

Table 2: Impact of COVID 19 on dentist in clinical practice.

Reasons for continuation of clinical practice	The needs of my patients	88 (35.6%)
	I don't want to lose my patients	24 (9.7%)
	I have good personal protective equipment	26 (10.5%)
	Financial reasons	38 (15.4%)
	I am not practicing	55 (22.3%)
	Others	16 (6.5%)
Reasons for not practicing	I fear for my health and life	1 (1.8%)
	I fear for the health and life of the members of my family	17 (30.9%)
	I work in insufficiently equipped dental office	7 (12.7%)
	My financial situation allows me to suspend my clinical work	5 (9.1%)
	Patients cancelled their appointments because they are afraid of contracting COVID19	2 (3.6%)
	The dental office where am employed is closed	16 (29.1%)
	Others	7 (12.7%)

Average working hours per day before COVID-19	<5 5 - 10 >10	29 (15.1%) 129 (67.2%) 34 (17.7%)
Average working hours per day currently due to COVID-19	<5 5 - 10 >10	150 (78.1%) 35 (18.2%) 7 (3.6%)
Cancellation of previously taken appointments by patients	Yes No	134 (69.8%) 58 (30.2%)
Presence of negative influence of COVID-19 pandemic on professional activity	Not at all Little Quite a lot Extremely	13 (6.8%) 60 (31.3%) 83 (43.2%) 36 (18.8%)
Modification of the choice of personal protective equipment due to COVID-19 as per guidelines	Yes No	182 (95.3%) 9 (4.7%)
Investments made due to COVID-19 for personal protective equipment and infection control	≤10,000 11,000 - 25,000 26,000 - 50,000 ≥51,000 None	63 (32.8%) 81 (42.2%) 13 (6.8%) 32 (16.7%) 3 (1.6%)
Difficulty in getting personal protective equipment	Yes No I don't know	99 (51.6%) 75 (39.1%) 18 (9.4%)
Delay in the delivery timing of dental materials	Yes No I don't know	152 (79.2%) 23 (12%) 17 (8.9%)
Increased cost of care provided due to COVID-19; patients willingness to afford for the raised cost	Yes; Yes No; No Yes; No No; Yes	47 (24.5%) 59 (30.7%) 72 (37.5%) 14 (7.3%)
Worried about contracting COVID-19 during clinical activity	Not at all Little Quite a lot Extremely worried	12 (6.3%) 56 (29.2%) 80 (41.7%) 44 (22.9%)
Worried about professional future	Not at all Little Quite a lot Extremely worried	27 (14.1%) 58 (30.2%) 72 (37.5%) 35 (18.2%)
Reasons for worrying	I don't know when this emergency situation will end Patients will have less money to spend The crisis of dental environment will get worse The need of new procedure and new device for safety and infection procedure The chance of losing my job or having to fire my employees Others	136 (70.8%) 47 (24.5%) 59 (30.7%) 56 (29.2%) 32 (16.7%) 13 (6.8%)
Aids that could help dental professionals DURING COVID-19 pandemic	Economic relief from Government Improvement of communication with patients Economic reliefs from dental associations Bank support Tax exempted health care supplies Others	102 (53.1%) 70 (36.5%) 57 (29.7%) 29 (15.1%) 91 (47.4%) 24 (12.5%)
Aids that could help dental professionals AFTER COVID-19 pandemic	Economic relief from Government Improvement of communication with patients Economic reliefs from dental associations	99 (51.6%) 71 (37%) 60 (31.3%)

	Bank support	41 (21.4%)
	Tax exempted health care supplies	84 (43.8%)
	Others	29 (15.1%)

The primary reasons for dentist's worry was not knowing when the pandemic will end and a majority of participants also stated the aids that could help during and after COVID-19 pandemic to be, economic or other relief from government, tax exempted health care supplies and economic reliefs from dental associations.

## DISCUSSION

The study was a cross-sectional online survey. Online platform was adopted as it is the most convenient and possible mode considering the COVID-19 pandemic. Other similar studies have also utilized online mode for survey and literature suggests online mode, a preferred one for surveys during lockdown and epidemic.<sup>[14]</sup> The aim of the study was to assess the impact of COVID - 19 on dental practice and practitioners. The study was designed with the above aim as transmission of COVID-19 poses significant risk for people who are in close contact with an infected individual, and the risk is greater among those who are in close proximity to the patient, i.e., relatives and healthcare workers. The distance between the working field and the dentist is approximately 35–40 cm, and certain procedures can be time-consuming, which puts the dentist at a higher risk of contracting COVID-19.<sup>[9, 15]</sup> Precisely, due to the high risk for dentists discussed by many authors, the regulatory bodies have advised dentists to provide only emergency or urgent services amidst a decrease in the number of patients, the reasons being fear of the pandemic and it's cross infectivity in a dental setup.<sup>[16, 17]</sup>

The main aim of the study focuses on the real impact of the COVID-19 outbreak on dental practice amidst the pandemic and going forward. Out of 247 respondents, 192 of them were continuing their clinical practice and the rest have suspended signifying the impact of the disease. 68.3% of dentists have also reported cancellation of appointments by patients have increased. The practitioners have also reported that there has been a negative impact (43.2%) quiet a lot and (18.8%) extremely on their professional activity. Moreover, most of the respondents affirmed to be afraid about contracting COVID-19. The results of a study conducted in April 2020 in a group of 650 dentists from 30 countries, 92% of dentists declared that they were afraid of carrying the COVID-19 infection from their dental practice to their families.<sup>[2]</sup> Additionally, in another study, facing COVID-19 contraction threat, 90% of dentists were concerned about their families and about themselves.<sup>[18]</sup> Similarly in our questionnaire, the respondents who suspended their practice were also concerned about the health of their family but only one respondent was afraid about his/her health. SARS-CoV-2 has been demonstrated to remain aerosolized for 3 hours after contamination and on plastics and stainless steel for up to 72 hours.<sup>[19]</sup>

There are practical guidelines recommended for dentists by the Centers for Disease Control and Prevention (CDC), the American Dental Association (ADA) and the WHO, and DCI to control the spread of COVID-19. Like with other contagious infections, these recommendations include PPEs, wearing an N-95 mask or Filtering face masks (FFP) such as FFP2, FFP3 mask, hand washing, detailed patient evaluation, rubber dam isolation, anti-retraction hand-piece before dental procedures, and disinfection of the clinic. A large number of dentists (90%) were aware of recent changes in the treatment protocols.<sup>[2]</sup> On the other hand in our study, 95.3% of respondents have modified their PPE according to the guidelines, thus their attitude regarding PPE has also improved. In March 2020, the WHO released a press report highlighting the severe shortage of personal protective equipment (PPE). Due to the shortages, research on refreshing face masks for extended wear and reusing them after a cleaning process emerged.<sup>[20]</sup> In our questionnaire, 12.7% of respondents suspended practice due to insufficiently equipped dental office, the participants also reported difficulties in getting PPE. On the other end, increased the cost of dental treatments which brings unfavorable opinions among patients. This pandemic has resulted in economic recession, having an impact on dental practice as well, the sectors are already facing financial crisis. It is important to note that the vast of the respondents were apprehensive about the professional future. The participants expect supportive measures like economic relief from Government, economic relief from dental associations, tax -exempted health care that could help the profession during and after pandemic. The limitation of the present study is that the study is cross-sectional in nature and with a lesser sample size. A large sample size and longitudinal study is recommended to yield in depth information in this context.

## CONCLUSION

Our study concludes that the COVID-19 has a significant negative impact on routine dental practices. According to the data collected and analyzed during the pandemic, it is evident that the respondents were and are highly concerned over the professional future, fear regarding contraction of COVID-19, closure or reduction of practice, aids from government and associations for practitioners. On the positive side, significant improvements were enforced in everyday dentistry like modification of recommended preventive measures and precautions in emergency conditions.

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