

Anxiety, Apprehension, and Awareness amongst Indian Dentists pertaining to the COVID-19 Outbreak: An online questionnaire based survey

¹Dr. Mamta Singh, MDS, Assistant Professor, ITS-CDSR- Muradnagar, Ghaziabad: 201206, India.

²Dr. Himani Dogra, BDS, General Dentist, Pathankot Punjab 145001, India.

³Dr. Vidya Sekhar, MDS Professor, ITS-CDSR- Muradnagar, Ghaziabad: 201206

⁴Dr Joochi Chandra, MDS, Assistant Professor, ITS-CDSR- Muradnagar, Ghaziabad: 201206, India.

⁵Dr Prashansa Sharma, MDS, Assistant Professor, ITS-CDSR- Muradnagar, Ghaziabad: 201206, India.

⁶Dr. Anubha Nirwal, MDS, Professor, Kothiwal Dental College & Research Centre, Moradabad-244001, India.

Corresponding Author: Dr. Mamta Singh, MDS, Assistant Professor, ITS-CDSR- Muradnagar, Ghaziabad: 201206, India.

Citation of this Article: Dr. Mamta Singh, Dr. Himani Dogra, Dr. Vidya Sekhar, Dr Joochi Chandra, Dr Prashansa Sharma, Dr. Anubha Nirwal, “Anxiety, Apprehension, and Awareness amongst Indian Dentists pertaining to the COVID-19 Outbreak: An online questionnaire based survey”, IJDSIR- September - 2021, Vol. – 4, Issue - 5, P. No. 18 – 29.

Copyright: © 2021, Dr. Mamta Singh, et al. This is an open access journal and article distributed under the terms of the creative commons attribution noncommercial License. Which allows others to remix, tweak, and build upon the work non commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Objectives: Dental practitioners are among those at risk due to their direct contact with possibly infected patients as front-line health care professionals during the coronavirus (COVID-19) pandemic. The goal of this study was to measure anxiety, apprehension, and awareness amongst Indian Dentists pertaining to the COVID-19 Outbreak while they were on the job.

Methods: From July 2nd to July 23rd, 2020, this study was conducted utilizing an online survey questionnaire and Google forms. A total of 485 doctors took part in the survey. To measure anxiety, awareness, and the financial impact of COVID-19 on dentists was analysed. For two-group comparisons, the Mann–Whitney test was

employed, while for multigroup comparisons, the Kruskal–Wallis test was used as a post-hoc test.

Results: The average age of the participants was 36.5 ± 9.2 years, with the majority (75.21%) being just graduate dentists. More than 80.1% of interviewees expressed concern about contracting COVID-19. Younger dentists and females have higher levels of anxiety than older dentists. The level of awareness and practice of COVID-19 precautions and infection-control measures among these dentists (94.1%) was found to be high, and was statistically substantially impacted by age, qualification, and designation (except GP vs. Specialist).

Conclusions: The research sheds light on the worry, practice changes, and financial effects that dentists operating in India face. Although Indian dentists have a

high degree of knowledge and awareness of needed procedures when it comes to the COVID-19 epidemic, they also have a significant level of fear.

Keywords: Anxiety, coronavirus, Indian dentists, economic, practice management

Introduction

All parts of life have been impacted worldwide since the development of the new coronavirus illness (COVID-19) in Wuhan, China. The COVID-19 epidemic has expanded exponentially (1, 2), infecting millions of individuals and killing hundreds of thousands of people throughout the world (3). Many nations have closed their educational institutions, businesses, sporting events, social gatherings, public meetings, and airports. In an attempt to prevent the spread of the virus, drastic measures such as individual self-quarantine and social distance regulations have been implemented (4). India's situation is no better than that of many other countries.

Since the first case of COVID-19 infection reported in Kerala, India. On January 27, 2020, a 20 yr old female presented to the Emergency Department in General Hospital, Thrissur, Kerala, with a one-day history of dry cough and sore throat. There was no history of fever, rhinitis or shortness of breath. India has so far recorded 26 million Covid-19 cases - second only to the US. It is the new epicentre of the global pandemic.

COVID-19 is a member of the Corona viridae virus family, which has a single-stranded RNA structure (5). This virus has the potential to cause serious respiratory infections and pneumonia in infected people, and it may be spread readily by hand contact, saliva, nasal droplets, and contaminated surfaces (2, 6).

Health-care workers, particularly dentists, are at a significant risk of contracting the illness (7). It's possible that this is due to their intimate contact with patients during normal dental operations, which raises the risk of

infection transmission (8, 9). Droplets and aerosols produced by high-speed handpieces, air-water syringes, and ultrasonic scaling during dental operations might create a contaminated pathogenic environment inside the dental working field during treatment of an infected individual (6, 9, 10). As a result, the risk of infection transmission within the dental team cannot be managed by normal protective measures used in everyday dentistry (8). In response to the infection's fast spread, the World Health Organization (WHO) and the American Dental Association (ADA) established special precautionary measures for dentists to follow solely during the treatment of urgent and emergency cases. Otherwise, they ordered that dental clinics remain closed during the epidemic (13, 14). During dental treatments, these rules stressed the use of necessary measures, such as wearing personal protective equipment (PPE) (13, 14).

Using antibacterial mouthwashes, a rubber dam, and a high-volume section during treatment operations, as well as frequent washing and disinfection of chair surfaces, door knobs, and floors, was also strongly advised (8, 15). For dentists and dental workers to do dental work in a safe working environment, it is critical to provide a secure workplace. The high infection rate of COVID-19 and the lack of personal protective equipment (PPE) may contribute to the dentist's concern. Dentists' anxiety levels have been proven to have a detrimental influence on decision-making, work quality, and burnout (16).

During the epidemic, however, demand for more expensive aerosol controlling devices like as the high efficiency particulate arrestor (HEPA) increased in dental practice (10). The cost of these preventive measures and limits in patient care may have had a significant financial impact on dentistry. As a result, if the outbreak persists indefinitely, dentists' future employment may be jeopardized.

Meanwhile, no research has looked at the amount of concern experienced by Indian dentists as a result of the COVID-19 epidemic, their knowledge of the disease and infection control protocols for preventing its spread, or the financial impact on their present practice. The goal of this study was to examine the impact of the COVID-19 epidemic on Indian dentists in terms of anxiety, awareness, and practice change, as well as the financial consequences for their dental profession, using a specifically created online-based questionnaire.

Methods

Sample Size and Study Population

Only completed questionnaires were included in the final analysis, as the survey was only distributed to registered Indian dentists. All incomplete forms and those returned outside the required timeframe were excluded.

The final sample size was equal to 485 dentists. Accordingly, the questionnaire link was distributed via emails to corresponding number of randomly selected dentists.

Design of the Questionnaire

To ensure uniform and validated distribution across all groups of dentists, including general practitioners, specialists, and consultants, throughout the country, Google forms was used to create the link for the questionnaire (illustrated in Table 1) that was distributed electronically via IDA to the targeted population. A pilot research with 36 dentists was done before the questionnaire was distributed (about 10 percent of the sample size). The data was then put into a spreadsheet and double-checked by two writers, after which a pre-launch analysis was conducted to ensure that all questionnaire components were internally consistent.

Table 1

Questionnaire

1. Do you have an anxiety of being infected with COVID-19 by a patient or co-worker? Y/N
2. Are you afraid of providing treatment for any patient? Y/N
3. If a patient is coughing or suspected to be infected with COVID-19 are you afraid to provide treatment for him or her? Y/N
4. Do you know the illness problems associated with COVID-19 virus? Y/N
5. Do you know the mode of transmission of COVID-19 virus? Y/N
6. Are you updated with the current WHO guidelines for cross infection control for COVID-19 virus? Y/N
7. Are you currently asking every patient if he or she has recently been in contact with an infected COVID-19 person person? Y/N
8. Are you anxious talking to patients in close proximity? Y/N
9. Are you afraid that you could carry the infection from your patients back to your family? Y/N
10. Do you feel anxious when you hear that one of your co-workers or colleagues has been infected with COVID 19? Y/N
11. Are you updated with the current WHO guidelines for cross infection control for COVID-19 virus? Y/N
12. Are you currently asking every patient if he or she has been recently in contact with an infected Covid 19 person? Y/N
13. Are you are you are staff members taking every patient's body temperature before performing dental treatment? Y/N
14. Are you deferring dental treatment for patients with suspicious symptoms? Y/N

15. Do you think the routine surgical mask is effective to prevent COVID-19 cross infection? Y/N

16. Do you think that N 95 mask should be used routinely in dental practice because of the current COVID-19 outbreak? Y/N

17. Do you routinely follow universal infection control protocol for every patient? Y/N

18. Do you currently use rubber am I solution for every patient as a part of your infection control? Y/N

19. Do you routinely use high-volume suction for every patient as part of droplets and airborne isolation precautions? Y/N

20. Do you routinely prepare antimicrobial mouth rinse for every patient to be used for before starting treatment? Y/N

21. Have you changed or increased the procedure of infection control during Covid-19 pandemic? Y/N

22. Has the schedule of your practice been changed to make it safer for you and the patient? Y/N

23. Do you routinely wash your hands with soap and water? Y/N

24. Do you sanitise before and after treatment of every patient? Y/N

25. Do you and your staff members get tested for Covid 19 as a precautionary measure? Y/N

26. Do you know which authority to contact if you come across a patient with suspected COVID-19 infection? Y/N

27. What is the average drop in the number of the patients visiting your practice as compared to the period before the COVID-19 pandemic?

a- N/A b-<25% c-25-50% d-50-75% e->75%

28. How many appointments for non-urgent cases have you cancelled recently as a part of COVID-19 precaution protocol?

a- N/A b-<25% c-25-50% d-50-75% e->75%

29. Because of the COVID-19 pandemic how much have the prices for your dental services been reduced if at all?

a- N/A b-<25% c-25-50% d-50-75% e->75%

30. If any, how many financial compensation government and non-governmental are you receiving for your losses in your practice?

a- N/A b-<25% c-25-50% d-50-75% e->75%

31. To what extent have you reduced the staff numbers in your clinic?

a- N/A b-<25% c-25-50% d-50-75% e->75%

32. By how much has a practice income been reduced due to the Covid-19 pandemic?

a- N/A b-<25% c-25-50% d-50-75% e->75%

33. What percentage of your stored dental materials have expired during the Covid-19 pandemic?

a- N/A b-<25% c-25-50% d-50-75% e->75%

34. If applicable, what has been the average reduction of working days during the COVID-19 outbreak?

a- N/A b-<25% c-25-50% d-50-75% e->75%

Statistical Analysis

Each question's demographic data and total responses were evaluated using descriptive statistics such as mean, standard deviation, and frequency/percentage. For inferential analysis in sections 2, 3, and 4, the Mann–Whitney test was used to compare two groups, whereas Kruskal–Wallis followed by a post-hoc test was employed to compare multiple groups. $p < 0.05$ was chosen as the statistically significant value. GraphPad Prism was used to conduct all of the analyses (Version 8.4.3, GraphPad Software, San Diego, CA, USA).

Results

The study included 435 dentists (218 males and 217 females) with an average age of 36.52 ± 9.2 years (range from 23 to 70 years) (Table 2). After removing 49 dentists who did not reply to the questionnaire within the stipulated period, the number of respondents represented

89.9% of the projected sample size (485). The number of responders (435) was deemed to be a good response rate (89.8 percent). Graduate dentists made up the bulk of responses (327, or 75.2%), while postgraduate dentists made up 108 (24.8%). General practitioners, specialists, and consultants each accounted for 47.8% (208), 47.4% (206), and 4.8 percent (20, respectively).

Table 2: Demographic characteristics of the study population.

Age (Years) (mean ± SD)	36.52 ± 9.2
Age range	23-70
Age Groups (Years)	
<=35	222 (51)
>35	213 (49)
Gender	
Male	218 (50.12) §
Female	217 (49.91)§
Qualification	
Graduate	327 (75.22)
Postgraduate	108 (24.84)
Designation	
General practitioner	208 (47.83)
Specialist	206 (47.41)*
Consultant	21 (4.82)
Workplace	
Clinic	202 (46.45)
Hospital	70 (16.14)
Both	163 (37.51)
Employment Type	
Private	135 (31.2)
Governmental	98 (22.5)
Both	202 (46.4)
Total	435 (100)

Section 2 questions on dentists' sentiments about the COVID-19 pandemic revealed that the vast majority of respondents (386, > 80%) (Figure 1A) were concerned about contracting the disease (Q1). Over 60% (274) of dentists were apprehensive about handling any patients (Q2). This worry was heightened (397, 91 percent) if a patient displayed symptoms of illness, such as coughing (Q3). Furthermore, 72 percent (316) of respondents said they felt uncomfortable being in intimate touch with their patients (Q4). The participants' highest-scoring reaction (413, 94%) was connected to the fear of spreading illness to their family (Q5), whereas the second-highest response (395, 90%) was related to learning that a coworker had been infected with COVID-19 (Q6).

The dentists' highest scores in section 3 questions related to their knowledge of the COVID-19 illness (Q7, 413, 94 percent) and its modes of transmission (Q8, 424, 97 percent), changes in infection control procedures (Q19, 410, 94 percent), rescheduling patients' appointments (Q20, 404, 93 percent), and handwashing before and after treatment (Q20, 404, 93 percent). (Q21, 416, 95 percent). In addition, three questions had (>80%) favorable responses: the dentist had current awareness on current WHO standards for infection control (Q9), delaying treatment of patients with worrisome symptoms (12), and followed universal infection control procedure (Q9) (Q15). In contrast, over 80% of respondents believed that N95 masks should be worn frequently in dental practice, with the lowest knowledge score (138, 31.7 percent) connected to the usefulness of surgical masks to prevent cross infection (Q13) (Q14). The response to (Q16) concerning using a rubber dam as an infection control method was also low, at 31.7 percent (138), while a greater proportion of responders (265, >60 percent) stated that they employed a high volume section as a preventive precaution measure (Q17).

COVID-19's economic impact was studied in this study using the section 4 questions (Figure 2). About 27% of those polled said that the cost of personal protective equipment has grown by more than 75% from its original cost (Q24). Meanwhile, 32% of dentists said the number of patients had decreased by 25–50%. (Q25). COVID-19 had a significant impact on income, as >75 percent of dentists reported a 25–50 percent decrease in income (Q30), with a similar reaction about the reduction in working days (Q32). The financial compensation obtained by dentists was insufficient, as more than half of the respondents were ineligible for any assistance programs (Q28). However, the majority of dentists who responded did not reduce their personnel numbers (Q29).

Table 3: Anxiety about COVID-19 infection among respondents.

Variables	Mean± SD	P-Value
AGE		
<35	5.14± 1.27	0.018*
>35	4.87 ±1.45	
Gender		
Male	4.78 ±1.57	0.003*
Female	5.24± 1.09	
Qualification		
Graduate	4.9 ± 1.39	0.37
Post- Graduate	5.1± 1.37	
Designation		
General practitioner (GP)	4.91±1.45	0.367
Specialist	5.12±1.35	>0.99
Consultant	5.24±0.91	>0.99
Workplace		
Clinic	4.81±1.46	0.003*
Hospital	5.32±1.10	0.015*
Both	5.21±0.89	>0.99

Employment Type		
Private	4.73±1.51	0.0467*
Governmental	5.12±1.1	0.015*
Both	5.19±1.34	0.064*
Total	5.012±1.37	

Table 4: Awareness of COVID-19 infection-control measures among respondents.

Variables	Mean± SD	P-Value
Age		
<35	11.15± 2.42	<0.001*
>35	12.89 ±2.24	
Gender		
Male	12.8±2.09	
Female		0.122*
Qualification		
Graduate	11.98± 2.49	0.03*
Post- Graduate	12.75± 2.29	
Designation		
General practitioner (GP)	12.47±2.34	>0.999*
Specialist	12.54±2.48	0.016*
Consultant	5.24±0.91	0.027*
Workplace		
Clinic	12.77±2.05	0.569*
Hospital	12.45±2.59	0.964*
Both	12.37±2.58	>0.999*
Employment Type		
Private	12.73±1.51	0.196*
Governmental	12.12±1.1	>0.999*
Both	12.19±1.34	0.674*
Total	12.65±2.37	

Inferential examination of the questionnaire sections revealed that older (>35 years old) and male respondents had significantly lower levels of COVID-19 anxiety than younger (35 years old, p = 0.018) and female (p = 0.003)

respondents, respectively (Table 3). Additionally, respondents who only worked in a hospital or a clinic and hospital had statistically substantially higher anxiety than those who only worked in a clinic. Those who worked alone in the government sector or in the government and private sector experienced statistically substantially more anxiety from COVID-19 than those who exclusively worked in private clinics.

Respondents' average awareness (part 3) was 12.65 ± 2.37 (Table 4). The age of the research participants had a statistically significant influence on respondents' knowledge, but not when male and female participants were compared. Furthermore, with the exception of GP vs. Specialist, qualification and designation were shown to have a statistically significant influence on respondents' knowledge ($P < 0.05$, Table 4). Meanwhile, there were no statistically significant changes in respondents' knowledge based on their workplace or kind of job (Table 4).

Discussion

The present cross-sectional study reported a high level of anxiety among Indian dentists as a result of the COVID-19 outbreak and high awareness about preventing its transmission and avoiding infection; in addition, they and their practices have been economically affected due to this pandemic situation. These findings are understandable because dentists fall within the highest risk category, since their practice is associated with generation of droplets and aerosols which is considered as a main route of virus transmission (6). The high levels of anxiety recorded among these Indian dentists can be considered as natural human feelings during the pandemic situation, especially in light of the increasing infection and mortality rates. The general weakness in India's medical foundations and care system (21, 22), as well as the exaggerated pressure on the health-care system due to the virus's rapid spread, and general feelings of stress and fear among healthcare

workers for their own and their families' safety (23). Furthermore, the nature of the disease, with its lengthy incubation period (up to 14 days), wide range of symptoms (from asymptomatic to death), and lack of a vaccine or therapy, are all variables that might exacerbate stress among healthcare personnel, particularly dentists. This backs with findings from COVID-19 (11), as well as past outbreaks of comparable infectious respiratory illnesses like SARS, which showed significant and long-lasting psychological stress, particularly among front-line healthcare professionals (24, 25).

Another noteworthy result in this study was that anxiety levels were greater among younger dentists than older dentists, and female dentists than male dentists. This contradicts claims that there are greater risk categories among infected people, such as older and male adults, who are more likely to develop severe respiratory symptoms and die than younger and females (26). It's possible that older dentists have more experience dealing with similar pandemic situations than younger dentists. This may make them more self-assured and less anxious. This was also reflected in the study's conclusion that dentists over 35 years old had a statistically significant greater degree of understanding of the virus and its mechanism of transmission than dentists under 35 years old. Furthermore, because women have more interaction with their children than other family members, the fear of spreading infection to family members, particularly their children, may cause female dentists to be more stressed than male dentists. This might be due to the fact that public facilities see a higher number of dental patients each day than private clinics (27). As a result, compared to dentists who operate solely in private clinics, who have more control over their appointments, case selection, and cancellation of non-emergency cases, this may raise dentists' fears and worry about becoming infected. Finally,

consultant dentists and those with a postgraduate degree have a greater level of awareness than their peers, which may be explained by the fact that the majority of these dentists work in academia, thus they are more up to speed on new advances in their profession, such as the COVID-19 epidemic.

Almost all of the dentists who responded were familiar with the COVID-19 disease and how it spread. This information is deemed critical when it comes to implementing infection control measures during dental treatment. Similarly, over 80% of dentists said they were up to speed on current WHO standards for cross-infection management in dental practice (14). Over 70% of responders asked their patients if they had come into touch with a COVID-19-infected person, and over 60% took their patients' body temperatures. This is, logically, fundamental information needed during a regular checkup to identify potentially infectious diseases in patients and to take the appropriate precautions. Indeed, in the case of a pandemic, the standard measures currently suggested by WHO and any other infectious control authority across the world for preventing cross-infection within dental practice should be strictly followed. Unfortunately, more than 60% of responders did not use rubber dam as a cross-infection control for every patient.

The use of a rubber dam efficiently restricts the spread of aerosols during the use of rotary tools, reduces the risk of ingesting tiny instruments, provides good working field isolation, and improves patient acceptability of dental operations (28). As a result, training courses and seminars for Indian dentists, particularly fresh graduates, are recommended to raise their understanding of the usefulness of rubber dam in preventing infection transmission. This might help them develop their hand abilities and make them more eager to choose rubber dam as a regular exercise. High-volume suction should also be

regarded an important strategy for controlling aerosols and droplets during normal dental practice (10). Antimicrobial mouthwashes should be used before any dental procedures, according to WHO recommendations for the present epidemic. Surprisingly, this suggestion was followed by almost 40% of the respondents. Mouthwashes containing chlorhexidine (29), 1 percent hydrogen peroxide (6), or povidone iodine (30) can help to reduce microbial load in the mouth. The latter shows virucidal action against the coronaviruses SARS-CoV and MERS-CoV. Before and after potential patient interaction, the operator is also encouraged to use povidone iodine as a nasal spray (0.4 percent) and mouthwash (0.5 percent) (31).

The majority of Indian dentists consistently focused on hand cleanliness before and after treating each patient, which is considered a crucial infection control practice for dental practitioners, according to the present study. The WHO infection management guidelines for the current pandemic recommend frequent hand washing with water and soap or the use of an alcohol-based sanitizer (14).

Hand washing and cleaning using alcohol-based sanitizers can successfully prevent the transmission of respiratory infections (8, 32). Furthermore, during the COVID-19 epidemic, the majority of research participants believed that N-95 respirators should be used instead of surgical masks in dental practice. When performing aerosol-generating operations, the WHO and ADA standards both suggest the use of personal protective equipment (PPE) (33).

The ADA and WHO recommendations also advised caution in selecting cases, scheduling appointments, and only receiving emergency cases (13, 14). Almost all of the participants in the present research said they had changed their appointment schedules to prevent the virus from spreading. This procedure might begin by contacting or

video conferencing individuals to determine their needs and whether or not their situation warrants therapeutic care (34).

This might aid in reducing face-to-face contact, making diagnoses via remote dental screening, preventing COVID-19-susceptible patients from working, postponing non-emergency work, and effectively preparing for emergency situations (8, 34). The economic damages caused by the COVID-19 epidemic to India's dentistry community, according to the conclusions of this study, amounted to nearly 50%. This is understandable in the event of a pandemic. Quarantines and lockdowns have been imposed around the country in an attempt to stem the spread of the disease.

The lockdowns alternated between total shutdowns of all sectors and partial shutdowns of certain sectors such as schools, universities, and tourism. Almost all activities, including dentistry, have suffered as a result (4). In addition, the majority of respondents in the current research reported fewer working days, appointments rescheduled to see only emergency patients, a lack of government assistance, and a decrease in overall revenue. However, because some research participants were paid, the degree of economic effect varies from one dentist to the next.

This can be explained by the fact that operating in private dental clinics was prohibited by the government during the national lockdown, and their sole source of revenue was their monthly government stipend. According to a recent research done in the United States, due to financial difficulties among dental patients, the economic impact on dental services might be extended until 2022. (35). These financial consequences for dentistry as a profession might have severe ramifications for the profession's future.

The fast changes in respondents' psychology and behavior as the present epidemic progresses should be recognized

as one of the study's weaknesses. Future improvements in scientific understanding regarding COVID-19 would undoubtedly affect dentists' attitudes and awareness. Furthermore, despite the fact that the current study's questionnaire was distributed through the IDA, consultants provided less replies than the other designations. This might be due to the overall fear that accompanied the COVID-19 epidemic, which shifted the priorities of prospective responders.

Conclusions

The development of the new coronavirus has raised concerns among healthcare personnel, particularly dentists, about germs that are spread by aerosols rather than through blood. This has significantly raised dentists' fear of contracting the illness, as well as their knowledge of a new era. Despite the fact that Indian dentists have a high degree of expertise and experience in dealing with the COVID-19 epidemic, their concern was considerable. In the current situation, it is critical to change traditional dentistry procedures to only deal with emergencies or to stop offices until the outbreak subsides.

However, this situation could persist indefinitely, having a significant impact not only on the economy, which has been shown to affect the majority of respondents by reducing their income by 50%, but also on the dental profession's future, such as increasing levels of anxiety among dentists and adapting to practice modification.

Acknowledgments

The authors would like to thank all the dentists who responded to this survey.

References

1. Neher RA, Dyrdak R, Druelle V, Hodcroft EB, Albert J. Potential impact of seasonal forcing on a SARS-CoV-2 pandemic. *Swiss Med Wkly.* (2020) 150:w20224. doi: 10.4414/smw.2020.20224 PubMed Abstract | CrossRef Full Text | Google Scholar

2. Khurshid Z, Asiri FYI, Al Wadaani H. Human saliva: Non-invasive fluid for detecting novel coronavirus (2019-nCoV). *Int J Environ Res Public Health*. (2020) 17:2225. doi: 10.3390/ijerph17072225 PubMed Abstract | CrossRef Full Text | Google Scholar
3. WHO. World Health Organization Coronavirus Disease (COVID-19) Dashboard. (2020). Available online at: https://covid19.who.int/?gclid=EAIaIQobChMIItvnC1ej16gIVxYjVCh0YUwNkEAAAYASAAEgJR DfD_BwE. Google Scholar
4. Nicola M, Alsafi Z, Sohrabi C, Kerwan A, Al-Jabir A, Iosifidis C, et al. The socio-economic implications of the coronavirus pandemic (COVID-19): a review. *Int J Surg*. (2020) 78:185–93. doi: 10.1016/j.ijisu.2020.04.018 PubMed Abstract | CrossRef Full Text | Google Scholar
5. Chen Y, Liu Q, Guo D. Emerging coronaviruses: genome structure, replication, and pathogenesis. *J Med Virol*. (2020) 92:418–23. doi: 10.1002/jmv.25681 CrossRef Full Text | Google Scholar
6. Peng X, Xu X, Li Y, Cheng L, Zhou X, Ren B. Transmission routes of 2019-nCoV and controls in dental practice. *Int J Oral Sci*. (2020) 12:1–6.
7. Administration OSaH. COVID-19 Control and Prevention/ Dentistry Worker and Employers. United States Department of Labor (2020). Google Scholar
8. Ather A, Patel B, Ruparel NB, Diogenes A, Hargreaves KM. Coronavirus disease 19 (COVID-19): implications for clinical dental care. *J Endod*. (2020) 46:584–95.
9. Meng L, Hua F, Bian Z. Coronavirus disease 2019 (COVID-19): emerging and future challenges for dental and oral medicine. *J Dent Res*. (2020) 99:481–7.
10. Ge Z-y, Yang L-m, Xia J-j, Fu X-h, Zhang Y-z. Possible aerosol transmission of COVID-19 and special precautions in dentistry. *J Zhejiang Univ Sci B*. (2020) 21:361–8.
11. Ahmed MA, Jouhar R, Ahmed N, Adnan S, Aftab M, Zafar MS, et al. Fear and practice modifications among dentists to combat Novel Coronavirus Disease (COVID-19) outbreak. *Int J Environ Res Public Health*. (2020) 17:2821
12. Ng K, Poon BH, Kiat Puar TH, Shan Quah JL, Loh WJ, Wong YJ, et al. COVID-19 and the risk to health care workers: a case report. *Ann Intern Med*. (2020) 172:766–7.
13. ADA. Summary of ADA Guidance During the COVID-19 Crisis. American Dental Association (2020).
14. WHO. Considerations for the Provision of Essential Oral Health Services in the Context of COVID-19. Interim Guidance: World Health Organization (2020).
15. CDC. Interim Infection Prevention and Control Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 (COVID-19) Pandemic. Centers for Disease Control and Prevention (2020).
16. Chipchase SY, Chapman HR, Bretherton R. A study to explore if dentists' anxiety affects their clinical decision-making. *Br Dent J*. (2017) 222:277–90. doi: 10.1038/sj.bdj.2017.173
17. Taherdoost H. Determining sample size; how to calculate survey sample size. *Int J Econ Manag*. (2017) 2:237–9.
18. Charan J, Biswas T. How to calculate sample size for different study designs in medical research? *Indian J Psychol Med*. (2013) 35:121–6. doi: 10.4103/0253-7176.11623 PubMed Abstract | CrossRef Full Text | Google Scholar

19. Tysiac-Miśta M, Dziedzic A. The attitudes and professional approaches of dental practitioners during the COVID-19 outbreak in Poland: a cross-sectional survey. *Int J Environ Res Public Health*. (2020) 17:4703. doi: 10.3390/ijerph17134703 PubMed Abstract | CrossRef Full Text | Google Scholar
20. Kamate SK, Sharma S, Thakar S, Srivastava D, Sengupta K, Hadi AJ, et al. Assessing Knowledge, Attitudes and Practices of dental practitioners regarding the COVID-19 pandemic: a multinational study. *Dent Med Probl*. (2020) 57:11–7. doi: 10.17219/dmp/119743 PubMed Abstract | CrossRef Full Text | Google Scholar
21. Ji Y, Ma Z, Peppelenbosch MP, Pan Q. Potential association between COVID-19 mortality and health-care resource availability. *Lancet Glob Health*. (2020) 8:e480. doi: 10.1016/S2214-109X(20)30068 PubMed Abstract | CrossRef Full Text | Google Scholar
- Al Hilfi TK, Lafta R, Burnham G. Health services in India. *Lancet*. (2013) 381:939–48. doi: 10.1016/S0140-6736(13)60320-7
22. Xie J, Tong Z, Guan X, Du B, Qiu H, Slutsky AS. Critical care crisis and some recommendations during the COVID-19 epidemic in China. *Intens Care Med*. (2020) 46:837–40. doi: 10.1007/s00134-020-05979-7
23. Tam CW, Pang EP, Lam LC, Chiu HF. Severe acute respiratory syndrome (SARS) in Hong Kong in 2003: stress and psychological impact among frontline healthcare workers. *Psychol Med*. (2004) 34:1197. doi: 10.1017/S0033291704002247
- McAlonan GM, Lee AM, Cheung V, Cheung C, Tsang KW, Sham PC, et al. Immediate and sustained psychological impact of an emerging infectious disease outbreak on health care workers. *Can J Psychiatry*. (2007) 52:241–7.
24. Jordan RE, Adab P, Cheng K. Covid-19: risk factors for severe disease and death. *BMJ*. (2020) 368:m1198. doi: 10.1136/bmj.m1198 PubMed Abstract | CrossRef Full Text | Google Scholar
25. Fernández-Feijoo J, Garea-Gorís R, Fernández-Varela M, Tomás-Carmona I, Diniz-Freitas M, Limeres-Posse J. Prevalence of systemic diseases among patients requesting dental consultation in the public and private systems. *Med Oral Patol Oral Cir Bucal*. (2012) 17:e89.
26. Madarati A, Abid S, Tamimi F, Ezzi A, Sammani A, Shaar MBAA, et al. Dental-dam for infection control and patient safety during clinical endodontic treatment: preferences of dental patients. *Int J Environ Res Public Health*. (2018) 15:2012. doi: 10.3390/ijerph15092012 PubMed Abstract | CrossRef Full Text | Google Scholar
27. Nayak SU, Kumari A, Rajendran V, Singh VP, Hegde A, Pai KK. Comparative evaluation of efficacy of chlorhexidine and herbal mouthwash as a preprocedural rinse in reducing dental aerosols: a microbiological study. *Int J Dent*. (2020) 2020:2021082. doi: 10.1155/2020/2021082 CrossRef Full Text | Google Scholar
28. Eggers M, Koburger-Janssen T, Eickmann M, Zorn J. In vitro bactericidal and virucidal efficacy of povidone-iodine gargle/mouthwash against respiratory and oral tract pathogens. *Infect Dis Ther*. (2018) 7:249–59. doi: 10.1007/s40121-018-0200-7 PubMed Abstract | CrossRef Full Text | Google Scholar
29. Mady LJ, Kubik MW, Baddour K, Snyderman CH, Rowan NR. Consideration of povidone-iodine as a public health intervention for COVID-19: Utilization as “Personal Protective Equipment” for frontline providers exposed in high-risk head and neck and skull base oncology care. *Oral Oncol*. (2020) 105:104724.
30. Fung ICH, Cairncross S. Effectiveness of handwashing in preventing SARS: a review. *Trop Med Int Health*. (2006) 11:1749–58. doi: 10.1111/j.1365-

3156.2006.01734.x PubMed Abstract | CrossRef Full Text | Google Scholar

31. Coulthard P. Dentistry and coronavirus (COVID-19)-moral decision-making. *Br Dent J.* (2020) 228:503–5. doi: 10.1038/s41415-020-1482-1 PubMed Abstract | CrossRef Full Text | Google Scholar
32. Ghai S. Teledentistry during COVID-19 pandemic. *Diabetes Metab Syndr.* (2020) 14:933–5. doi: 10.1016/j.dsx.2020.06.029 PubMed Abstract | CrossRef Full Text | Google Scholar
33. Nasseh K, Vujicic M. Modeling the Impact of COVID-19 on U.S. Dental Spending: Health Policy Institute Research Brief. American Dental Association (2020).