

Knowledge, Attitude and Perception Regarding COVID-19 Infection Control: A Cross-Sectional Study among Dentists in Bangalore City, India

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ABSTRACT

Objectives: The dental profession is one of the occupations at the highest risk of SARS-CoV-2 infection because of the involvement of aerosol-generating procedures. The aim of this study was to assess the knowledge, attitude, and perception of dentists regarding COVID-19 infection control in Bangalore city.

Methods: A cross-sectional study was conducted among dentists in Bangalore city using an online questionnaire. The questions were related to socio-demographic data and the knowledge, attitude and perceptions of the dentists towards COVID-19 and infection control during dental practice. A sample size of 254 dentists was obtained after duration of 2 months. Descriptive statistics were performed and the data obtained were presented in the form of graphs and tables

Results: The study included 254 participants (188 females and 66 males) majority of whom belonged to an age group of < 30 years (78.3%). A total of 209 (83.3%) of the study participants have completed a master's degree in dentistry. Among 254 dentists, 141 (55.5%) of them had received training regarding infection control in dentistry while only 102 (40.2 %) of them had attended any training regarding COVID-19. Majority of the dentists were aware about the symptoms, modes of transmission, diagnosis, risk identification and important measures for prevention of COVID-19 transmission. Most of the dentists perceived COVID-19 as a serious public health issue (85.4%).

Conclusions: The study has shown an acceptable level of awareness and preparedness among the dentists working in Bangalore city considering the aim of the study. However, SARS-CoV-2 infection is a novel disease and is yet to be fully explored. Adequate research has to be carried out to shed light on the unexplored areas regarding COVID-19 and infection control.

KEYWORDS: COVID-19, Dentist, Infection, Infection control

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INTRODUCTION

The coronavirus disease (COVID-19) is a rapidly spreading viral infection. It is considered more contagious than severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS).¹ The etiological agent for COVID-19 is a novel coronavirus called severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It causes pneumonia, with symptoms ranging from mild to deadly. SARS-CoV-2 infection in humans can cause an acute inflammatory response (cytokine storm) and respiratory failure.² The routes of human-to-human transmission of corona virus are through airborne droplets, touching or coming in contact with an infected person or a contaminated surface.¹ Virus-containing airborne droplets

(5-12 micrometers) and aerosols (5 mm) from infected people are transmitted into the environment via breathing, speaking, coughing, or sneezing. Susceptible people can become infected if these respiratory droplets or aerosols settle on their mucosal membrane or are inhaled. It can even spread when a susceptible person touches the contaminated surface with viruses and then transfer it to their mucus membrane.³ Other routes such as blood or saliva have not been confirmed but may be possible because of the documented transmission of infectious diseases such as HIV/AIDS, hepatitis B and C virus through the same. This hence increases the concern over the route of transmission for COVID-19 in the dental setting.¹

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On January 30, 2020, the World Health Organization (WHO) declared the Coronavirus outbreak as a global health emergency of international concern and on March 11, 2020 as a global pandemic.⁴ As of July 6, 2020, COVID-19 had spread to 216 countries, resulting in 11,496,926 confirmed cases and over 535,390 mortalities.²

The major concern in a dental set up during the COVID19 scenario is the risk of cross-infection between the dentists and the patients. Treatment which involves the use of rotary dental and surgical instruments such as hand pieces or ultrasonic scalers, air-water syringes and other procedures serve as a direct route for virus spread. Hence the standard protective measures taken during routine dental work may not be effective enough to halt the potential spread of coronavirus, especially during emission of large number of droplets and aerosols from asymptomatic cases.⁵

The SARS-CoV-2 infection has brought about a new, unanticipated challenge to dental professionals all around the world.⁶ Due to the involvement of aerosol generating procedures the dental profession is regarded as one of the occupations at the highest risk of SARS-CoV-2 infection. Therefore, it is critical that the risk of transmission through dental procedures is minimized through proper understanding and actions.²

In view of growing importance of Infection control in dental settings during COVID19 pandemic, it is imperative to study the awareness of dentists about the characteristics of SARS-CoV-2 and the new infection control standards. The aim of the study is to explore the knowledge, attitude and perception of dentists towards COVID19 Infection control in Bangalore city.

METHODS

Study population and setting:

A cross-sectional study was conducted to assess the knowledge, attitude and perception of dentists regarding COVID19 infection control in Bangalore City. The registered dentists who were currently working in Bangalore in private clinics, public sector or institutions and consented for participation were included in the study. The dentists who were not practicing currently were excluded from the study.

Study instrument

The questionnaire used for the survey was a structured multiple choice questionnaire in English language. It comprised of a series of questions related to socio-demographic data and the knowledge, attitude and perceptions of the dentists towards COVID-19 and infection control during dental practice.¹

Collection of data

Data was collected using an online questionnaire created with the help of Google Forms. The questionnaire was sent to all the participants in various online groups for dentists in Bangalore city using different online platforms. An online

informed consent was obtained from the participants before the study after explaining the objectives and methodology of the study. Those dentists who filled the questionnaire in the allotted time period of the study were included in the study. A sample size of 254 dentists was obtained after the study duration of 2 months. Each participant was contacted individually through offline or online method to ensure that he/she was a dentist by profession and was currently working in Bangalore city.

Statistical analysis of data

The following statistical procedures were carried out:

Data obtained was compiled systemically in Microsoft Excel 2013 spread sheet and a master table was prepared. The data set was subdivided and distributed meaningfully. The data was proof read, and later presented in the form of graphs and tables. Descriptive Statistical analyses were performed using Statistical Package for Social Sciences software (SPSS version 22).

RESULTS

The present study was conducted to assess the knowledge, attitude and perception of dentists regarding COVID-19 infection control in Bangalore City.

Characteristics of the study population:

The study included a total of 254 participants who filled the questionnaire within the allotted time period for data collection. The participant characteristics are given in Table 1.

A total of 209 (82.3%) of the study participants have completed a master's degree in dentistry. Out of 254 dentists, 141 (55.5%) of the participants had received training regarding infection control in dentistry while only 102 (40.2%) of them had attended any training regarding COVID-19.

Knowledge about the symptoms, and mode of transmission of the COVID-19 Infection:

Majority of the study participants (98%) opted fever and cough as the major symptoms followed by shortness of breath (96.1%) and sore throat (95.3%). Most of the dentists correctly reported the modes of transmission of COVID-19 Infection [Table 2]

Awareness about the diagnosis and risk of COVID-19 Infection and the measures for preventing its transmission in dental clinics:

Majority of the study participants (97.6%) recorded Real-time Polymerase Chain Reaction with respiratory material as the test to be performed for diagnosis of COVID-19 Infection. [Table 3]

Most of the participants (94.9%) considered the presence of symptoms of a respiratory infection to identify patients at risk while over 85% of the population considered history of travel as well as history of contact with an infected person in identification of the same in contracting COVID-19 Infection.

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Over 90 % of the dentists opted people with immune system deficiency, elderly, people with chronic diseases and health care providers as high risk groups for COVID-19 Infection [Table 3]

Most of the dentists recorded that frequently cleaning hands using alcohol- based hand rub or soap and water, facemask usage by a known or suspected patient, routine cleaning and disinfecting of surfaces in contact with known or suspected persons and usage of Personal Protective Equipment by all health care members as the measures to be taken for prevention of COVID-19 transmission. [Table 3]

Majority of the study participants (88.6%) knew how to use Personal Protective Equipment (PPE) and perform isolation procedures (85%) on patients to minimize chances of exposure. 96.9 % of the study participants considered Personal Protective Equipment as useful in protection from COVID-19 and also considered changing both masks and gloves regularly as very important (93.7%) to decrease the possibility of transmitting infections to patients and themselves.

Out of 254 participants, 104 dentists (41 %) were confident in handling suspected COVID-19 patients to a considerable or great extent.

Sources of information

Approximately 77 % of the study participants reported that they were up to date on the latest information about COVID-19. [Table 4]

Risk perception and attitude of dentists regarding COVID-19 Infection.

Almost all the study participants perceived COVID-19 Infection as dangerous (98.4%) [Figure 1]. Majority of the study participants (85.4%) believed that COVID-19 is a current serious public health issue [Figure 2] and all the participants considered educating people about COVID-19 as important to prevent the spread of the diseases.

Out of 254 participants, 171 (67.3 %) believed that COVID-19 symptoms often resolve with time and do not require any special treatment. More than half (57.1%) of the 254 study participants preferred to avoid working with a patient who is a suspect of COVID-19.

In case a patient was sneezing or coughing in the clinic, 50.4 % of the dentists recorded that they would refer the patient without treating him/her, 46.5 % recorded that they would treat the patient and ask him/her to go to the hospital and, only 3.1 % recorded they would refuse the treatment and ask the patient to leave the dental clinic.

A vast majority of the dentists (99.2 %) believed that asking patients to sit far from each other, wearing masks while in the waiting room, and washing hands before getting in the dental chair as necessary and would help to decrease disease transmission.

Over 80 % of the study participants (89 %) recorded that they would not allow any of their dental staff to work with patients

who had flu- like symptoms and considered the dentist role in teaching others about COVID-19 as very significant (81.9%).

Preparedness for COVID-19 Infection

Majority (73.6 %) of the study participants considered themselves prepared for the COVID-19 outbreak. [Figure 3] Majority of the study participants recorded that they knew whom to contact when a situation of unprotected exposure to the virus occurs (91.7 %) and knew what to do if they have signs or symptoms of the disease (97.2 %).

DISCUSSION

This cross-sectional study provides an insight on the level of knowledge, attitude and perception of dentists working in Bangalore city on COVID-19 infection control. The survey showed that majority of the dentists belonged to a younger age group of less than 30 years (78.3 %) and had less than 5 years of dental practice (79.9 %). Most of the participants in the present study were females (74 %) considering the gender wise distribution. This may be because of the high proportion of females in dental profession in the country. This was comparable with a study done by Khader et al in 2020.¹

Present study showed that majority of the study participants (50.4 %) worked in a private clinic. This result was comparable with a study done by Dhanya et al in 2016.⁷

Knowledge about COVID-19 Infection was found to be adequate among the dentists in the current study. Majority of the study participants were able to identify the main symptoms of COVID-19 and the modes of transmission which could help them to recognize the threat and take appropriate actions which can be considered important in the management and control of the spread of the disease. This result was comparable with a study done in Jordon by Khader ET al.¹

Majority of the study participants were aware about the diagnosis and risk of COVID-19 Infection and the measures to be taken for the prevention of its transmission in dental clinics. Almost all of the study participants (97.6 %) reported that Real-time Polymerase Reaction with respiratory material is the test to be performed for the diagnosis of COVID-19 Infection. Majority of the dentists recorded presence of symptoms of a respiratory infection, history of travel, and history of contact with an infected person to identify patients at risk of COVID-19 Infection. In a previous study done in Indonesia it was reported that 67% of the participants had comprehensive knowledge about virus detection methods.²

According to the present study, high risk groups for the disease were identified to be people with immune system deficiency, elderly people with chronic diseases and health care providers.

Dentists in the present study were able to identify the measures to be taken in the prevention of COVID-19 transmission. Majority of the study participants recorded that disinfection and sanitation procedures and use of Personal Protective Equipment by the dental staff and patients as

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measures to be taken for preventing COVID-19 spread. Most of the participants agreed that the Personal Protective Equipment were useful in COVID-19 protection and knew how to use them. Most of the dentists in the current study knew how to perform isolation procedures on patients to reduce the risk of exposure and also understood the importance of timely changing of protective barriers. In a study done by Widyaman et al it was reported that the majority of the participants were able to correctly answer the questions regarding prevention of COVID-19 infection.² In a previous study done among US dentists, it was found that 99.7% of the dental offices were using enhanced infection protection and control practices and many had also adopted advanced PPE.³

However, only 41 % of the sample of dentists was confident to a considerable or great extent in handling suspected COVID-19 patients.

In the present study, majority of the study participants relied on information from a genuine source such as media (91.3 %) for timely update on COVID-19 Infection. In a study done among dentists in Saudi Arabia, dental consultants and specialists showed higher awareness response of 90 % and dentists with experience of eleven years or more showed 92.4 % regarding the latest news on COVID-19 pandemic.⁶ Many studies have shown similar results, where professionals with higher education and experience displayed higher awareness.⁸⁻¹¹

Majority of the dentists in the current study perceived COVID-19 Infection as dangerous (98.4%) and considered it to be a current serious public health issue and understood the importance of educating the public about COVID-19 to prevent the virus transmission. Almost two-third of the study sample believed that the COVID-19 symptoms self resolves over time and didn't require any special treatment. In a previous study, almost half of the dentists believed that the disease self resolves over time and didn't require any special treatment.¹

The attitude of dentists regarding the treatment of patients during COVID-19 pandemic in their clinics varied. More than half of the study participants preferred to avoid working with a patient who is a suspect of COVID-19. In case a patient was coughing or sneezing, almost half of the dentists in the current study would refer the patient without treating him/her, 46.5 % would treat the patient before referring to a hospital while the rest of the dentists would refuse the treatment and ask the patient to leave the dental clinic. In a similar study, it was reported that 43.8 % would refer the patient to the hospital without treating them, 49.5% would treat the patient and refer them to the hospital and 4.6% would refuse the treatment.¹

Majority of the dentists considered precautionary measures among the patients in the dental clinic as important during COVID-19 pandemic. They believed that asking the patients to maintain social distancing, to wear masks and perform hand hygiene as necessary in decreasing the COVID-19

transmission. In a similar study done in Saudi Arabia, it was found that almost two-third of the participants agreed that the dental reception area adopted the proper COVID-19 preventive measures.⁶ Furthermore, studies have shown that social distancing has been advocated as an important measure in preventing the COVID-19 disease transmission.¹²

Most of the study participants were concerned about the safety of their dental staff and would not allow any of their dental team members to work with patients who had flu-like symptoms. Dentists in the present study considered the role of dentist in educating the public about COVID-19 as very significant. In a similar study, it was reported that almost all the dentists (97.8%) knew about the importance of educating others about COVID-19 infection.¹

In the current study, most of the dentists believed that they were prepared for the COVID-19 outbreak. Majority of the study participants knew whom to contact when an unprotected exposure occurs and what to do if they have signs and symptoms of the disease. However, when asked about the preparedness of their country, only 26 % of the dentists gave a positive response.

Despite the findings of the current study, it is important to mention the limitations that were faced during the course of the survey, including the short period of data collection. This may have affected the sample size and the response rate of the study. Convenience sampling strategy was adopted which was not based on a random selection of sample. It has to be mentioned that the survey was conducted while the pandemic was still active. Furthermore, SARS-CoV2 infection is considered new and is not a fully understood or investigated topic. COVID-19 updates and recommendations are changed, modified or added frequently, hence the study focuses on where we currently stand and cannot be generalized.

Overall, the study has shown an acceptable level of awareness and preparedness among the dentists working in Bangalore city concerning the knowledge about COVID-19 infection, its transmission and measures for prevention. However, SARS-CoV-2 infection is a novel disease and is yet to be fully explored. Since the updates and recommendations about the disease are changed, modified or added frequently, the dentists have to make sure that they are up to date and well informed regarding the best practices and recommended disease management protocols. Educational sessions and training for the dentists adhering to the latest COVID-19 recommendations have to be carried out. Dental practitioners have to closely monitor their staffs and patients to ensure that they follow guidelines issued by the Ministry Of Health or the concerned authority. Lastly, adequate research has to be carried out to shed light on the unexplored areas regarding COVID-19 disease and infection control.

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DECLARATIONS

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Table 1. The characteristics of the study participants (n=254)

Variable	Dentists, n (%)
Age (years)	
< 30	199 (78.3)
30-39	37 (14.6)
40-49	13 (5.1)
≥ 50	5 (2)
Gender	
Female	188 (74)
Male	66 (26)
Years of practice	
≤ 5	203 (79.9)
6-10	33 (13)
>10	18 (7.1)
Work place	
Public sector	28 (11.02)
Private clinic	128 (50.39)

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Institutions	98 (38.58)
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Table 2. Awareness of the study participants (n=254) about symptoms and modes of transmission of COVID-19 Infection

Variable	Dentists, n (%)
Symptoms of COVID-19 Infection	
Fever	249 (98)
Cough	249 (98)
Shortness of breath	244 (96.1)
Sore throat	242 (95.3)
No symptoms	205 (80.7)
Diarrhoea	172 (67.7)
Runny nose	151 (59.4)
Joint/muscle pain	133 (52.4)
Rash	64 (25.2)
Red eyes	54 (21.3)
Modes of transmission	
Coughing and sneezing	252 (99.2)
Hand shaking	232 (91.3)
Touching surfaces such as door knobs and tables	223 (87.8)

Table 3. Awareness of the dentists (n=254) regarding diagnostic tests, identification of patients at risk, high risk groups and measures for prevention of transmission of COVID-19 infection

Variable	Dentists, n (%)
Diagnostic tests	
RT-PCR with respiratory material	248 (97.6)
RT-PCR with serum sample	161 (63.4)
Chest X- ray	105 (41.3)
Identification of patients at risk of COVID-19 infection	
History of travel to COVID-19 hit areas	218 (85.8)
History of contact with possible infected patient	227 (89.4)
Presence of symptoms of a respiratory infection	241 (94.9)
Presence of symptoms of diarrhoea	95 (37.4)
High risk groups	
Health care providers	230 (90.6)
Elderly	239 (94.1)
Male gender	31 (12.2)
Children	175 (68.9)
People with immune deficiency	244 (96.1)
Travellers	165 (65)
People with chronic diseases	233 (91.7)
Measures for prevention of transmission	
Frequently clean hands by using alcohol-based hand rub or soap and water	252 (99.2)
Eat boiled and cooked food	167 (65.7)
Put face mask on known or suspected patients	245 (96.5)
Place known or suspected patients in adequately ventilated single rooms	218 (85.8)
All health staff members wear protective clothing	243 (95.7)
Avoid moving and transporting patients out of their area unless necessary	221 (87)

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Routinely clean and disinfect surfaces in contact with known or suspected patients	244 (96.1)
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Table 4. Sources of information of the study participants (n=254) about COVID-19 infection

Sources of information of the dentists on COVID-19	Dentists, n (%)
Media (newspaper, television, radio etc.)	232 (91.3)
Social network (Facebook, twitter etc.)	194 (76.4)
Friends or family member	130 (51.2)
Medical doctors or routinely visited physicians	131 (51.6)
Academic training courses	87 (34.3)
Colleagues	134 (52.8)
Government organization such as Ministry of Health	168 (66.1)

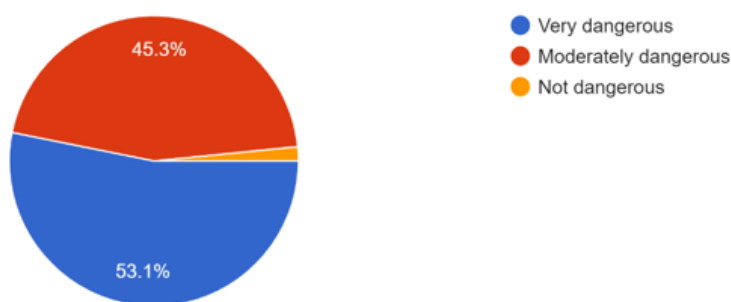


Fig 1. Distribution of study participants according to how they perceived COVID-19

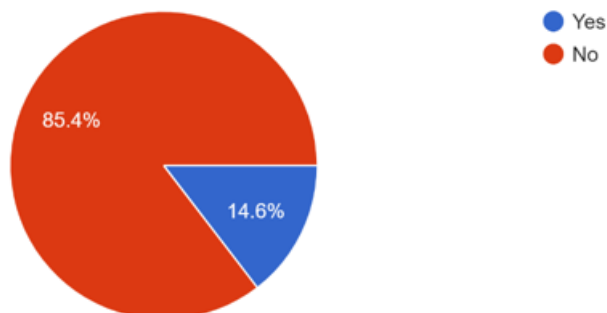


Fig 2. Distribution of study participants when asked whether they considered COVID-19 as a serious public health issue

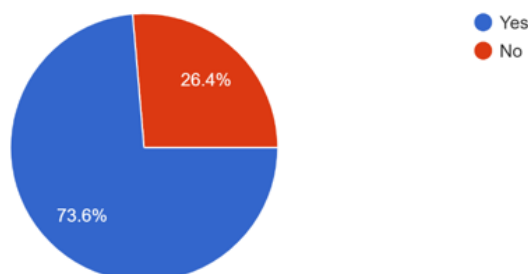


Fig 3. Distribution of study participants according to whether they considered themselves prepared for COVID-19 outbreak