

Infection Control In Dental Practice During Covid-19 Pandemic: A Questionnaire Based Cross Sectional Study

Research Article

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Abstract

Objective: In the event of an outbreak, the dentist can be the first person to come in contact with an infected person; they can either unknowingly become a carrier and infect others or by following proper guidelines can prevent the possible spread of the disease and save the entire community from its disastrous consequences. The aim of this study is to assess the awareness of COVID-19 disease related infection control practices among dentists and dental students.

Materials And Methods: An online questionnaire was distributed among dentists and dental students on COVID-19 awareness and infection control among dentists. The questionnaire was divided into 4 sections: the 1st one contained an informed consent form, the 2nd, 3rd, 4th sections had the demographic details (9 questions), COVID 19 Awareness (10 questions), Infection control (10 questions). The data was analysed using Epi info (version 7.2.2.6, CDC, license: public domain) software with frequency distribution, descriptive statistics and chi square test.

Results: A total of 316 responders completed the questionnaire based survey on COVID-19 awareness and infection control among dentists. About 77.8% participants (245) have good knowledge and 22.2% (70) participants have fair knowledge regarding COVID 19 awareness and infection control.

Conclusion: The dentists were found to have good knowledge and practice scores, which is important to combat COVID-19. They are advised to follow the Centres of Disease Control and Prevention (CDC) and World Health Organization (WHO) guidelines in their clinics, and sensitize their staff so that no stone is left unturned in defeating this pandemic.

Keywords: Covid-19; Infection Control; Dentist; Dental Practice; Pandemic.

Introduction

The novel coronavirus belongs to a family of single-stranded RNA viruses known as Coronaviridae [1]. This family of viruses are known to be zoonotic or transmitted from animals to humans [2]. As the published genome sequence for this novel coronavirus has a close resemblance with other beta-coronaviruses such as SARS-CoV and MERS-CoV, the Coronavirus Study Group of the International Committee on Taxonomy of Viruses has given it the scientific name SARS-CoV-2, even though it is popularly called the COVID-19 virus [1, 2].

In December 2019, the 2019 novel coronavirus disease (COV-

ID-19) caused by novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) emerged in China, followed by a rapid spread all over the world. On March 11, 2020, the World Health Organization (WHO) raised its pandemic alert. As of March 2021, COVID-19 had caused over 122,992,844 confirmed cases and 2,711,071 deaths in 189 countries and overseas territories or communities [3].

A large number of medical staff were reported to have acquired the disease while working with infected individuals. The dental clinic is not an exception for a similar possibility of transmitting and acquiring the infection between staff or individuals; moreover, the dental clinic could be a riskier environment for spreading

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the virus because of the close contact with patients and the nature of the dental treatment [4].

Aerosols are defined as liquid or solid particles suspended in the air by humans, animals, instruments, or machines. Aerosols, which are responsible for the transmission of airborne micro-organisms by air, consist of small particles named droplet nuclei (1–5µm) or droplets (>5µm). Droplet nuclei can stay airborne for hours, transport over long distances and contaminate surfaces by falling down [5]. Patients infected with COVID-19, without showing symptoms, are of a great threat to dentists and other members of the dental team. Dentists, thereby, should entertain a high level of awareness and integrity to deal with the disease and be able to control and manage its spread [4].

Patients diagnosed with COVID-19 have the relatively prolonged incubation period of the disease [the median incubation period was estimated to be 5.1 days, 95% CI 4.5-5.8 [6] or up to 14 days for some cases [7, 8] before any symptoms could even be detected] and the post infection period make it challenging for medical staff to recognize the existence of COVID-19 infections, which could increase the transmission of the disease during these lay periods. Therefore, patients infected with COVID-19, without showing symptoms, are of a great threat to dentists and other members of the dental team. Dentists, thereby, should entertain a high level of awareness and integrity to deal with the disease and be able to control and manage its spread [4].

There are practical guidelines recommended for dentists and dental staff by the Centres for Disease Control and Prevention (CDC), Dental council of India (DCI), the Indian Dental Association (IDA), and the World Health Organization to control the spread of COVID-19. It is important to implement sound prevention measures in dental clinics and to increase the level of awareness among dentists to improve their prevention. Hence, this study aimed to assess the level of awareness and infection control against COVID-19 among Indian dentists [4].

Material and Methods

This was a questionnaire-based survey adapted from current interim guidelines and information for dentists provided by the WHO, US Centres for Disease Control and Prevention (CDC), IDA and DCI [9-11]. We performed a cross-sectional survey of a convenient sample of respondents. This survey was conducted in April 2020. An online questionnaire using Google Forms was used to collect the data.

However, each participant who was randomly selected was contacted individually to make sure that they were a dentist. The questionnaires were anonymous to maintain the privacy and confidentiality of all information collected in the study. Ethical approval was obtained from the Institutional Review Board at Sathyabama institute of Science and Technology.

The questions on the survey were developed after reviewing pertinent literature and the international guidelines [9-11]. The questionnaire was designed in English and comprised of a series of questions pertaining to socio-demographic characteristics, the knowledge of dentists, and their attitudes and perceptions toward COVID-19 and infection control in dental clinics. The survey

was a structured multiple choice questionnaire divided into sections: The questionnaire was divided into 4 sections: the 1st one contained an informed consent form, the 2nd, 3rd, 4th sections had the demographic details (9 questions), COVID 19 Awareness (10 questions), Infection control against Covid-19(4 questions). Descriptive statistics was performed for all the groups and sub-groups.

Simple random sampling method was used for data collection and the distribution of responses was presented as frequency and percentages. Sub-groups were classified on the basis of gender, age (18-30 years, 31-45 years, and >45 years) and profession (undergraduate, graduate students and faculty from dental colleges and clinical practitioners). Data were tabulated in excel, and descriptive statistics were performed using Epi info (version 7.2.2.6, CDC, license: public domain) software.

Results And Discussion

Results

This study included a total of 316 dentists and dental students. Their age ranged from 21-60 years with the maximum of 215 (68.3%) dentists in the age group of 21-30 years. The gender distribution was predominantly female 223 (70.8%)

A total of 178 (56.5%) were undergraduate dental students, 69(21.9%) were postgraduate dentists. Years of dental practice ranged from < 1 year, 1-5 years, 5-10 years, 10 -15 years and >15years, of which 175 (55.6%) were dental students and dentists with an experience ranging from 5-10 years were 64 (20.3%).

A total of 233(73.9%) dentists were working in educational institutions and 100 (31.7%) were working in dental clinics. Of which majority of the dentists were attached to private sectors 290(92.1%) Based on the place of work, 246 (78.1%) were working in urban and 53(16.8 %) were working in semi-urban. (Table 1)

Awareness about the virus, Signs and symptoms, Mode of transmission

When asked about the virus causing corona virus disease 162 (50.8 %) reported as SARS-CoV2 and 135(42.3%) reported as 2019-nCoV. Most of them correctly reported Wuhan, China 313(99.3%) as the place Covid-19 was first diagnosed. The percentage of dentists who reported the different symptoms of the COVID-19 infection mode of transmission (Table 2). Majority of the dentists reported fever, dry cough 310(98.4%) and 291(92.3%) reported shortness of breath, 242(76.8%) reported sore throat as symptoms. Mode of transmission was reported as coughing and sneezing by 295(93.6%) dentists and 274 (86.9%) dentists reported hand shaking or touching surfaces such as door-knobs and tables (Figure 1).

Infection control and Treatment of Patients with COVID-19

On discussing about preparing the waiting room for infection control in dental clinic 291 (91.5 %) dentists reported that routine cleaning and disinfecting the surfaces in contact with known or suspected patients and 278 (87.4 %) dentists said placing chairs

3-6 feet apart with physical barriers is essential. Precautionary actions that needs to be taken by the patient in dental practice was reported as wearing masks in the waiting room by 305 (95.9%) and 286 (89.9%) reported that patients must be asked to sit far from each other, 283 (89%) of the dentists chose that patients must be asked to wash hands before getting in the dental chair (Table 3).

Attitude towards treatment of patients with COVID-19

Majority of the dentists reported that the dental procedures that required priority care during lockdown are un-controlled bleeding or dental or facial trauma obstructing airway by 303 (95.3%) dentists while 252 (79.2%) dentists reported that cellulitis or diffuse bacterial infections with edema to be treated as priority. On asking dentists what they would do if the patient is sneezing and coughing in clinic, 219 (68.9%) dentists reported that the patient must be referred to the hospital without treating them .It was also reported that the most efficient Personal protection of the dentist to prevent exposure was to wear personal protective equipment such as dental goggles, masks and gloves by 290 (91.2 %) dentists. While 267 (84%) dentists reported that using N95 respirators, FFP3-standard mask to be used while treating dental patients is essential.

Clinical management of patient

Taking a detailed travel & health history, contact details & address of all patients is reported as the most efficient way to manage by

290(91.2%) dentists, whereas, taking temperature readings as part of the routine assessment of patients was reported as the efficient clinical management by 288(90.6%) dentists.

Discussion

We present here a study to assess the awareness of COVID-19 disease, infection control methods among dentists and dental students with a comparison of many features among them. It is heartening to note that the knowledge with respect to COVID-19 is relatively high among the respondents.

An online questionnaire was distributed among dentists and dental students on COVID-19 awareness, prevention and infection control among dentists. The questionnaire was divided into 4 sections: the 1st one contained an informed consent form, the 2nd, 3rd, 4th sections had the demographic details (10 questions), COVID 19 Awareness (10 questions), Infection control against Covid-19(10 questions) with a total of 25 questions .Scores were allotted for each question with a total of 50 marks. The respondents were categorised into fair (18-34), good (35-51) and poor (<17) based on the score obtained.

Majority of the respondents scored Fair (27%) and good (73%). Whereas only a hand full of respondents scored poor. Statistical analysis was done, frequency percentage (%), crosstab analysis and chi square test were used to portray the characteristics of the participant.

Figure 1. Shows frequency distribution of mode of transmission according to study participants.

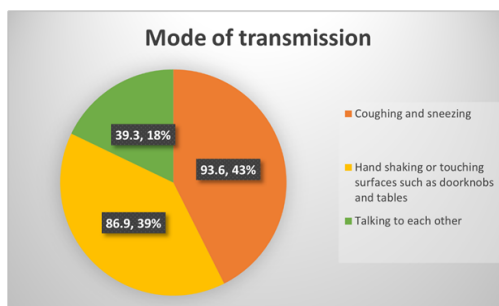


Figure 2. Shows gender, qualification and work place distribution of the study participants.

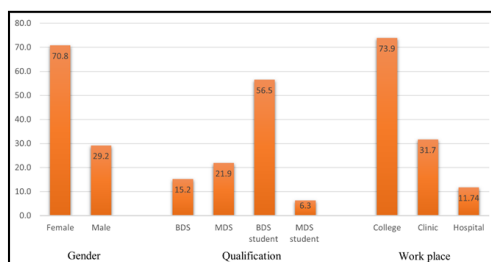


Figure 3. Shows frequency distribution of Source of information regarding COVID-19.

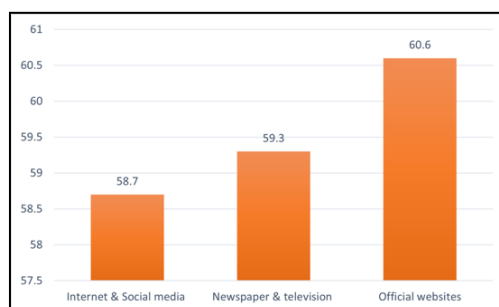


Table 1. Shows demographic details of the participants.

Variable	Dentist (n)	%
Signs and symptoms		
Fever ,dry cough	310	98.4
Shortness of breath	291	92.3
Diarrhoea	106	33.6
Running nose	117	37.1
Sore throat	242	76.8
Conjunctivitis	53	16.8
Skin rash	45	14.2
Joint or muscle pain	78	24.7
Chest pain	73	23.1
May present with no symptoms	2	0.6
Vomiting	1	0.3
Mode of transmission		
Coughing and sneezing	295	93.6
Hand shaking or touching surfaces such as doorknobs and tables	274	86.9
Talking to each other	124	39.3

Table 2. Showing frequency distribution of signs & symptoms and mode of transmission answered by participants.

Variable	Dentist (n)	%
Age		
21-30 years	215	68.3
31-40 years	88	27.9
41-50 years	10	3.2
51-60 years	2	0.6
Gender		
Female	223	70.8
Male	92	29.2
Qualification		
Undergraduate dentist	48	15.2
Postgraduate dentist	69	21.9
Undergraduate dental student	178	56.5
Postgraduate dental student	20	6.3
Years of Dental Practice		
< 5 years	1	0.3
> 15 years	12	3.8
1-5 years	46	14.6
11-15 years	17	5.4
5-10 years	64	20.3
student	175	55.6

Females had significantly better knowledge statistically than males (P = 0.610) [4, 12] On statistical analysis ,chi square test revealed that out of 315 samples 223 were female and it was also proved that 161(72.2%) scored good and 62 (27.8%) scored fair. Whereas among male participants, 69 (75%) scored good and 23 (25%) scored fair. Females were predominant in this sample, which was similar to other studies [4, 12] which explained that this might be

because the number of female dentists in Jordan is higher than the number of male dentists based on the latest Jordan Dental Association statistics [13]. The p value was calculated as 0.610 which shows that gender role is statistically insignificant.

Based on the occupation, since all the samples were dentists and dental students, cross tabulation was done based on their educational qualification, in which 91.3% postgraduate dentists scored

Table 3. Showing the infection control questions answered by the participants and its percentage.

Variable	Dentist (n)	%
Preparing waiting room for infection control in dental clinic		
Post a visual alert sign board at the entrance & provide supplies for respiratory hygiene	231	72.6
Routinely clean and disinfect surfaces in contact with known or suspected patients	291	91.5
Place chairs 3-6 feet apart with physical barriers	278	87.4
Remove toys, reading material, other communal objects and clean them	215	67.6
Precautionary actions to be taken by the patient in dental practice		
Ask patients to sit far from each other	286	89.9
wear masks while in the waiting room	305	95.9
wash hands before getting in the dental chair	283	89
No precaution required and could cause panic	10	3.1
Include travel history while recording case history	2	0.6
Avoid working with a patient with a suspected case of COVID-19	1	0.3
Dental situations which require priority care during lockdown		
Acute dental pain (pulpitis)	189	59.4
Cellulitis or diffuse bacterial infections with edema	252	79.2
Uncontrolled bleeding OR dental or facial trauma obstructing airway	305	95.9
Changing intra-canal medication	38	11.9
Patient sneezing or coughing in clinic		
Refer the patient to the hospital without treating them	219	68.9
Refuse treating the patient and ask them to leave the clinic	27	8.5
Treat the patient and ask them to go to the hospital	114	35.8
Personal protection of the dentist to prevent exposure		
Use N95 respirators ,FFP3-standard mask to be used while treating	268	84.3
Personal protective equipment such as dental goggles, masks, and gloves	285	89.6
Usual clinical apron is sufficient along with masks, gloves	81	25.5
Disposable cover all gown -inner to be changed daily & outer to be changed after each patient	236	74.2
clinical management of patient		
Take a detailed travel & health history, contact details & address of all patients	293	93
Take temperature readings as part of the routine assessment of patients	288	91.4
Have patients rinse with a 1%hydrogen peroxide solution before each appointment.	221	70.1
Use a rubber dam and high-speed evacuation	195	61.9

good and 16.7% undergraduate dentist scored fair. When asked about the experience, 93.1% dentists with experience of more than 10 years scored good compared to 61.7% dental students who scored good. On comparing the workplace based on clinic, educational institution, and hospital, 35.9% working in educational institutions scored fair. Sufficient knowledge was significantly correlated with dentists attached to the government and private sector. On performing chi square test, p value was obtained as 0.556 which shows statistical insignificance (Figure 2).

In a changing world, both healthcare professionals and the general public need to have reliable and accurate sources of information. The questions were framed using information from the World Health Organization (WHO), Up to date, Indian Council of Medical Research (ICMR), Centre for Disease Control (CDC), National Institute of Health (NIH) NIH, and website resources. On questioning about the main source of information for the dentists, a majority of 60.6% claimed that various official websites such as WHO, ICMR, CDC, DCI, IDA, Govt. Of India for

reliable information, this is an indicator of their faith in health organizations across the world. (Figure 3) At the time that the survey was conducted, online webinars via zoom or other applications were just beginning in India to educate clinicians searching for answers. This is not reflected in our current study due to many of the responses being filled before the same or the respondents not being part of these audiences. Social media at 58.7% is the least source for the respondents. Since social media is prone to fake news, it is heartening that dentists and dental students are not learning much from it [14].

Conclusion

The COVID-19 pandemic has affected the world in various ways. The deficiency of information, the need for accurate information, and the rapidity of its dissemination are important, as this pandemic requires the cooperation of entire populations. The rapid survey that we conducted had a good response and we show that dentists and dental students were quite well informed about the

coronavirus. They are aware of the measures needed to be taken to reduce the spread of the disease. The knowledge present allows the authors to speculate that the lockdown in India would be effective. The public receives a large amount of information from official websites like WHO, ICMR, DCI, IDA, and the medical fraternity and government need to develop strategies to ensure that accurate information needs to spread in these forums. The awareness is quite high and it is important that the knowledge of communication channels be known and be kept at the topmost priority throughout the pandemic.

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