

COVID-19 Awareness of 140 Dental Assistants in Tehran, Iran: A Cross-Sectional Survey

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ABSTRACT

Background and Aim: The rapid outbreak of coronavirus disease 2019 (COVID-19) in Wuhan, China has led to a public health crisis. Dental professionals have a major role in preventing the viral infection cycle. This study targeted to investigate the knowledge of 140 dental assistants in Tehran, Iran, about COVID-19.

Materials and Methods: A cross-sectional survey was conducted in Tehran, Iran, using a 27-item questionnaire, which consisted of 7 multiple-choice questions about the demographic information of the participants and 20 multiple-choice questions about their awareness. The data were analyzed with multivariable generalized estimating equations (GEE) using student t-test.

Result: A total of 140 participants (22 males and 118 females with a mean age of 29.40±6.21 years) responded to the questionnaire. The majority of respondents (91.4%) mentioned cough and fever as the main symptoms of COVID-19 infection. Tooth extraction and root canal therapy were mentioned as emergency treatments according to 98.6% of respondents. 89.3% of respondents chose phone calls as the best screening tool. The knowledge and attitude of participants showed a significant correlation with their educational degree.

Conclusion: The knowledge of dental assistants about COVID-19 infection was fair. The participants' awareness showed no correlation with their gender, work experience, place of occupation, and the specialty of the dentist that they assist.

Keywords: COVID-19, Dental Care, Knowledge

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Introduction:

The rapid outbreak of coronavirus disease 2019 (COVID-19) in Wuhan, China has led to a public health crisis and spread exponentially to other parts of the world.⁽¹⁻⁴⁾ COVID 19, the new virus, belongs to a family of RNA viruses with a single strand genome, known as coronaviridae.⁽⁵⁾

These viruses often cause upper respiratory tract infections.^(6,7) There are three subtypes of these viruses with an animal origin, including severe acute respiratory syndrome coronavirus (SARS-CoV), Middle East respiratory syndrome

virus (MERS-CoV), and novel coronavirus (2019-nCoV), which has recently caused deadly infections in humans.⁽⁸⁾ There is strong evidence that COVID-19 is similar to the coronavirus species found in bats and anteaters, which confirms the animal origin of the disease. COVID-19 patients usually present with clinical signs and symptoms of fever, dry cough, and muscle pain. Less common symptoms, such as nausea, diarrhea, and olfactory disorders (hyposmia and dysgeusia), have also been reported.^(6,7,9,10)

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) usually spreads through respiratory droplets and contact with objects and aerosols.⁽¹¹⁾ Thus, the infected person's cough or sneeze can spread SARS-CoV-2 viral particles into the environment, which can potentially contaminate people within a distance of 2m. Another important route of transmission is through close contact with confirmed cases or asymptomatic carriers.⁽¹²⁾ It has been suggested that SARS-CoV-2 can bind to human angiotensin-converting enzyme receptors. These receptors are highly concentrated in the salivary glands; this may explain the presence of SARS-CoV-2 in saliva. Therefore, the transmission of COVID-19 via aerosols and droplets generated during different activities may lead to the spread of infection in the dental office.

Dental clinics have a major role in preventing the viral infection cycle.⁽¹³⁾ Dentists and dental staff are at the frontline of exposure to viral infection due to close contact with a large number of droplets and aerosols, the long incubation period of the disease, and the high proportion of asymptomatic patients.⁽¹⁴⁾ Their knowledge of strategies to prevent viral transmission is crucial to pandemic prevention; therefore, it is important to determine their knowledge about COVID-19. Hence, the aim of this study was to investigate the knowledge of dental assistants in Tehran about COVID-19 and its clinical relevance and prevention.

Materials and Methods:

The Ethics Committee of the School of Dentistry of Tehran University of Medical Sciences approved the study protocol (Code: R.IAU.DENTAL.REC.1399.124). Informed consent was obtained from all respondents. To protect the respondents' privacy, the survey was anonymous. In this descriptive cross-sectional study, dental assistants' awareness about COVID-19 (clinical signs and symptoms, routes of transmission, control and prevention protocols, and principles of patient admission and clinical procedures) was evaluated. For this purpose, a Persian questionnaire consisting of 26 questions (seven questions related to demographic information and 19 questions related to knowledge assessment) was prepared according to previous studies.⁽¹⁵⁻¹⁷⁾ The

demographic information section was at the beginning of the questionnaire and included gender, age, educational degree, work experience, and place of work and residence. These variables were requested in the form as fill in the blank for age and work experience and multiple-choice questions for gender (female or male), educational degree (diploma and less, master's degree, bachelor's degree, and higher degrees), and place of occupation (faculty clinic, dental clinic, dental hospital, and personal office). The questionnaire consisted of 19 questions: seven regarding clinical presentations, 4 regarding transmission routes, and 8 regarding prevention and control of COVID-19. The questionnaire was distributed among a group of assistants available for study. After completing the information forms, the data was collected over a specified period and analyzed.

The questionnaire included three types of questions: true/false, questions with one correct answer, and multiple-choice questions. The scores obtained from the knowledge questionnaire were calculated, and quantitative descriptive indicators were extracted. A correct answer was assigned 1 point, and an incorrect/unknown answer was assigned 0 points. The total knowledge score ranged from 0 to 12, with a higher score denoting a better knowledge of COVID-19.

The Cronbach's alpha coefficient of the knowledge questionnaire was 0.71 in our sample, indicating acceptable internal consistency. Correspondingly, the effect of the mentioned factors on the level of knowledge was evaluated using the multiple linear regression model.

The statistical analysis was conducted using SPSS 26.0 (SPSS Inc., Chicago, IL, USA). The results of the descriptive analyses were presented as mean and standard deviation (SD). The correlation between demographic data and knowledge was evaluated using t-test. The significance level was set at $P < 0.05$.

Results :

This study included 140 (22 males and 118 females) dental assistants. Their age ranged from 20 to 54 years with a mean of 29.4 ± 6.2 years. Dental work experience ranged from 1 to 25 years with a mean of 5.7 ± 4.3 years. The participants' demographics are shown in Table 1.

Table 1. The demographics of the 140 dental assistants enrolled in the study

Parameter	Number (%)
Gender	
Female	118 (84.2%)
Male	22 (15.8%)
Age group (year)	
20-30	93 (68.4%)
31-40	40 (27.1%)
41-54	7 (4.5%)
Years of practice	
< 10	61 (43.4%)
10-20	64 (45.9%)
> 20	15 (10.7%)
Place of occupation	
North	41 (29.3%)
South	33 (23.6%)
East	32 (22.9%)
West	34 (24.3%)
Education:	
Diploma or less	43 (30.0%)
Associate degree	58 (41.4%)
Bachelor's degree	30 (21.4%)
Master's degree or higher	9 (6.4%)
Work for a specialist:	
No	84 (57.9%)
Yes	56 (42.1%)

Awareness about the symptoms and mode of transmission of COVID-19:

The percentage of assistants who reported the different symptoms of COVID-19 is shown in Table 2. The majority reported fever and cough as the main symptoms. Constipation, respiratory distress, hyposmia, and dysgeusia were reported by almost more than 80% of assistants. Only a few assistants reported muffled voice and dry skin. Over 80% of assistants reported that patients with COVID-19 might present with no symptoms (Table 2). Moreover, according to the questionnaire, 84.3% of participants declared fever, dizziness, dry cough, and myalgia as the main symptoms of COVID-19. Correspondingly, 68.6% of respondents declared runny nose as one of the main symptoms of viral infection.

Table 3 shows the routes of virus transmission during dental treatment. Aerosols created by coughing and sneezing or during dental practice were considered as the main transmission route of viral infection, while few assistants believed in viral transmission via excised or scratched skin. 11.4% of assistants believed that there is a likelihood of virus transmission through sterile and disinfected instruments.

Awareness of emergency treatments during COVID-19 outbreak in dental clinics:

Table 2: Participants' knowledge and attitude toward the main symptoms of COVID-19

Symptoms	Number (%)
Cough	128 (91.4%)
Fever	128 (91.4%)
Constipation	122 (87.1%)
Respiratory distress	123 (87.9%)
Weakness	96 (68.6%)
Smell and taste loss	125 (89.3%)
Dry and wrinkled skin	25 (17.9%)
Sore throat	100 (71.4%)
Muffled voice	16 (11.4%)
Nasal obstruction	82 (58.6%)
No symptom	113 (87.3%)

According to Table 4, the assistants believed that emergency treatments must be done during the COVID-19 outbreak despite the probability of virus transmission. According to the participants, emergency treatments include treatments that alleviate patients' pain and discomfort, including extraction and root canal therapy of painful teeth.

Abscess drainage was the second most common emergency treatment according to 87% of the participants. None of the participants advocated aesthetic treatments during the pandemic. Less than 20% of participants believed that superficial caries restoration and preventive treatments must be performed in this period.

Table 3- Participants' knowledge and attitude toward transmission routes of viral infection

Transmission	Number (%)
Coughing and sneezing (floating aerosols)	138 (98.6%)
Salivary and respiratory droplets	119 (85.8%)
Scratched or excised skin	62 (44.3%)
Aerosols created during dental practice	121 (86.4%)
Sterile instruments	18 (11.4%)

There are various approaches to prevent the transmission of viral infections among dental staff and patients. Some of these strategies are listed in Table 5. According to the data, using a rubber dam and high-pressure suction in addition to N95 masks is crucial to prevent the transmission of viral particles. 95.7% of participants believed that using ordinary masks is sufficient to prevent viral transmission. 98.7% of participants believed that infected patients should be quarantined immediately. Furthermore, 57% of participants believed

Screening COVID-19 patients is another important element in preventing the transmission of viral infection in dental offices.

Table 4: Participants’ knowledge and attitude toward emergency treatments during COVID-19 pandemic

Emergency treatment	Number (%)
Dental extraction and root canal therapy	138 (98.6%)
Aesthetic dentistry	0 (0%)
Removal of bothering tooth segments	111 (73.8%)
Abscess drainage	122 (87.1%)
Treatment of superficial caries	12 (8.6 %)
Blood control after extraction	122 (87.1%)
Crown cementation	58 (34.3%)
Caries prevention (fissure sealant)	9 (6.4%)
Denture modification	83 (59.3%)

The data related to this topic are presented in Table 6, which indicates “phone calls without referring to dental offices” as the best method of screening. Screening of patients by the personnel is another effective strategy.

Table 5: Participants knowledge and attitude toward infection control during viral pandemics

Preventive strategies	Number (%)
Using a rubber dam and high-pressure suction	119 (85 %)
Extraoral radiography only	95 (67.9%)
Referring with companions	23 (16.4%)
Wearing N95 masks plus surgical masks	119 (85 %)
Mouthwash before an appointment	104 (74.3%)
Recalling emergency patients simultaneously	7 (5%)

Table 6: Participants’ knowledge and attitude toward patient screening methods

Screening strategies	Number (%)
Phone call	125 (89.3%)
Chest computed tomographic scans for all patients	24 (17.1%) 117 (83.6%)
Screening by personnel	81 (57.9%)
Screening by dentist	7 (5%)
Screening based on common cold symptoms	

Dental staff can take many approaches to improve patient appointments. The list of questions is shown in Table 7. According to the participants, the best tool to improve patients’ appoint-

ment of COVID-19:

Overall, 126 participants (98%) mentioned the name of COVID-19 correctly. All participants believed that there is no vaccine to immunize individuals against infection. Additionally, 65% of participants mentioned the correct convalescence period of the COVID-19 virus (7 to 10 days).

In general, 125 assistants (89.3%) believed that there is no effective treatment against this viral infection but symptomatic treatment can alleviate the symptoms. In addition, 99 assistants (70.7%) believed that not all individuals are at the same risk of virus morbidity. Only 20 participants (28%) held that patients without fever could not transmit viral particles.

The results of Pearson's correlation coefficient showed that participants’ awareness had no correlation with their age ($P=0.399$), educational degree ($P=0.307$), and location ($P=0.699$).

Discussion:

There is a high transmission risk of viral infection through close contact; therefore, if the protective protocols are not effectively followed, the average distance of 30 to 45 cm should be kept between dental staff during practice. Long treatment sessions increase the transmission risk. ⁽¹¹⁾ The present study was conducted in Tehran in 2020 to evaluate the knowledge and awareness of dental assistants regarding the transmission cycle of COVID-19 in dental clinics.

The study population included dental assistants in Tehran. Most of the respondents were women because of the difference in the recruitment criteria.

The awareness of the participants was estimated as 81% in the present study. Khader et al reported a 91% rate of awareness, which was in accordance with our findings. ⁽¹⁶⁾

Understanding the incubation period is critical in treatment planning. ⁽¹⁷⁾ The incubation period of the COVID-19 virus has been measured as approximately 9 to 14 days. ⁽¹⁸⁾ In the present study, 65% of the respondents answered this question correctly. The rate of correct answers to the same question was 34.1% and 65% in similar studies. ^(19,20)

The results of the current study showed that nearly 93% of the respondents held that there is no effective vaccine against this virus. Singh

Gambhir et al showed that only 56% of the Indian dentists answered the same question correctly.⁽²⁰⁾

Nearly 95.7% of the respondents declared that it is necessary for everyone to wear protective masks. Khader et al reported that 79% of the subjects thought that masks were necessary to all; this difference can be attributed to the difference in the prevalence rate between the two societies.⁽¹⁶⁾

Moreover, 96% of the respondents believed that asking about a patient's traveling history was the best tool to recognize patients with COVID-19. This finding is in accordance with the findings by Kamate et al and Ahmed et al.^(21,22)

In our study, 81% of respondents believed that using a hand sanitizer is the best way to protect against the virus transmission cycle. Kamate et al also showed that most of the dentists agreed that keeping good hand hygiene is the most effective way to discontinue the virus transmission cycle.⁽²¹⁾

In the present study, 91.4% of respondents declared that fever is the main symptom of COVID-19. Ahmed et al presented that 81% of the dentists measured patients' body temperature before starting the operation.⁽²²⁾

Furthermore, 85% of respondents stated that using two triple-layered masks is the best protective approach to prevent virus transmission. Ahmed et al concluded that 85% of the dentists believe that wearing only one mask does not protect against viral infection.⁽²²⁾

In this study, 85% of respondents held that using a rubber dam and high-pressure suction is effective in controlling aerosols. Ahmed et al found that 84% of the participants preferred using a rubber dam and suction during dental treatment.⁽²²⁾

In the present study, 74.3% of respondents believed that using mouthwash before dental treatment is effective against virus transmission. Ahmed et al reported that only 24% of patients use mouthwash before treatment.⁽²²⁾

In this research, root canal therapy and tooth extraction were introduced as emergency treatments. Ahmed et al concluded that even emergency treatments should be delayed for 10 to 14 days according to dentists in Saudi Arabia.⁽²²⁾

In the current study, the knowledge of assistants working for specialists was much higher than that of assistants working for general den-

tists. This finding is in accordance with the findings by Kamate et al.⁽²¹⁾ Harapan et al reported that the awareness of general practitioners is much higher than that of specialists, which is not in accordance with the findings of our study.⁽²³⁾

Conclusion:

According to the findings of the present study, the awareness of dental assistants in Tehran about COVID-19 infection was fair. Home educational programs are suggested for dental assistants. There was no correlation between the participants' awareness and demographic data including gender, work experience, place of occupation, and the specialty of the dentist that they assist.

Fever, cough, and constipation were among the main signs and symptoms of COVID-19 patients. Tooth extraction and root canal therapy were among emergency treatments. Using hand sanitizers, patient screening through phone calls, taking the traveling history of patients, wearing N95 masks, and using high-pressure suction plus rubber dam were among suggested prophylactic approaches for virus spread prevention.

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