



**ASSESSMENT OF KNOWLEDGE AND AWARENESS ABOUT COVID-19 AMONG
DENTAL PRACTITIONERS-- A CROSS-SECTIONAL STUDY**

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ABSTRACT

Introduction- Corona viruses are a group of viruses that primarily infect the upper respiratory and gastrointestinal tract. Disease increases in human-to-human contact via respiratory droplets. The disease has impacted dentists due to close proximity to the patients, entailing high-speed instrumentation, and aerosols in clinical settings, and since then the dental practitioners instructed to carry out only emergency treatment. Such information on the knowledge and awareness of dentists is needed to prevent COVID-19 transmission in the dentist. **Objective-** To assess knowledge and awareness of COVID-19 among dental practitioners. **Materials and Method-** A cross-sectional study was conducted among 220 dental students and general practitioners to assess knowledge and awareness about COVID-19. The data was collected self-administered structured questionnaire in an electronic form mainly about demographic data and general knowledge about symptoms of COVID-19, precautions and practices, standard precautions, and prevention methods. **Results-** Participants lacked the knowledge in managing COVID-19, especially at the undergraduate level. **Conclusion-** More efficient and appropriate response to future pandemics, dental curriculums, and educational activities should pro-actively provide training opportunities.

KEYWORDS: Knowledge of COVID-19, Dental practitioners, Cross sectional study, Dental precautions, Disease transmission, Infection control.

INTRODUCTION

Coronavirus disease 2019 (COVID-19) is defined as an illness caused by a novel coronavirus, now called Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2; formerly called 2019-nCoV). COVID-19 is an emerging respiratory infection that was first discovered in December 2019, in Wuhan city, Hubei Province, China. SARS-CoV-2 belongs to the larger family of ribonucleic acid (RNA) viruses, leading to infections, from the common cold to more serious diseases, such as Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV). The main symptoms of COVID-19 have been identified as fever, dry cough, fatigue, myalgia, shortness of breath, and dyspnea.^[1,2]

This highly contagious, zoonotic virus started infections in a small city and spread rapidly to most parts of the world and created a global health emergency. The World Health Organization (WHO) called for a collaborative effort to tackle the situation and declared it a global pandemic on March 12, 2020,^[3] In India, the first case of COVID-19 got reported in Trissur, Kerala, on 27th January in a 20-year lady with a travel history to China. The rapid movement of people from the global epicenters and between the cities facilitated COVID-19

transmission in India, and the infection started spreading to the major cities of India.^[4]

Research findings indicated that COVID-19 can spread from person to person via respiratory droplets through coughing, sneezing, or even talking; by physical contact with an infected person; or by touching a contaminated surface.^[5] Previous observational studies have reported that even asymptomatic patients in the incubation phase or healthy carriers can transmit the virus.^[6-9] The human-to-human transmission of COVID-19 created an alert with the increasing number of cases reported worldwide.

The diagnosis for COVID-19 is made by identifying contact history, clinical manifestations, radiographic changes on CT chest imaging, and laboratory tests. Currently, laboratory diagnostics offer the most accurate and reliable results, and include Reverse Transcriptase Polymerase Chain Reaction (RT-PCR) tests. RT-PCR is mainly used to detect viral RNA from respiratory secretions such as expectorated sputum, oropharyngeal, and nasopharyngeal samples. It is important to note that a negative RT-PCR test result will not exclude the patient from having the virus and other diagnostic criteria should be considered. The current treatment approach of COVID-19 consists of early detection,

isolation, and providing supportive care for developing symptoms.^[10,11]

In dental practice, the risk of transmission of COVID-19 is quite high due to inevitable close contact between dentists and their patients.^[12] As a preventive measure, D'Amico et al.^[13] recommended not having multiple patients in the waiting room and maintaining a distance of at least 1.5 m between persons. Airborne droplets and aerosols have been identified to be the main route for transmission of COVID-19 in the dental clinic. Routine dental treatment procedures usually involve the use of instruments such as ultrasonic scalers, air-water syringes, and air turbine handpieces that become contaminated with the patients' saliva and blood, and subsequently generate infectious aerosols and droplets in the workplace. Unfortunately, most types of dental intervention involve droplet/aerosol generating procedures and this shows the high level of risk for infection with COVID-19 in the dental environment.^[14]

Incubation periods for the virus are said to range from 2-14 days increasing the likelihood of post dental treatment spread.^[8] The CDC has provided strict guidelines in dealing with all patients as carriers. Patients identified with respiratory symptoms should be provided with surgical masks and quarantined immediately in a separate room. Guidelines also include that body temperature for both patients and dental staff should be measured before entering the dental office.^[9,15] Hand hygiene was found to be the most critical measure in reducing the risk of transmitting COVID-19, in addition to disinfecting surfaces thoroughly. Dentists should defer any elective procedures, while limiting treatment to dental emergencies in order to decrease the chance of spreading the virus.^[16] If a patient presents with a dental emergency, additional precautions are needed during the procedure. Precautions include personal protective equipment, such as masks, gloves, gowns, and face shields, while using 4-handed technique for better infection control. The use of rubber dams and high-volume saliva ejectors can help in minimizing aerosolization during dental procedures.^[8,9] Guidelines and precautions to the COVID-19 virus have only recently been provided and require that both dentists and students actively acquire updated knowledge that will likely continue to change as the behavior of COVID-19 is better understood. Given the exposure risk for different working categories, dental practitioners are the workers facing the greatest coronavirus risk.^[17]

However the aim of the study was to assessment of knowledge and awareness about covid-19 among dental practitioners.

MATERIALS AND METHOD

A one-month duration cross-sectional study was conducted to assess the knowledge and awareness about COVID-19 among dental practitioners including undergraduate students, post-graduate students, and

general practitioners. The 220 participants were selected using non-probability convenient sampling. The dental practitioner who agreed to take part and provided informed consent were included in the study. The data was collected using a piloted self-administered structured questionnaire in an electronic form. The questionnaire was mainly about demographic data such as (age, gender, and profession) as well as knowledge about symptoms of COVID-19, precautions and practices, standard precautions, and prevention methods. The data collected was entered and analysed using SPSS Version 23.

RESULT

A total sample of 220 participants was reached, with 168 females and 52 males representing 76.4% and 23.6% of the sample (Table 1 and 2). The sample includes undergraduate students, post-graduate students, and general practitioners (Table 3). Almost all of the participants 350 (96%) believed that dentists are at a high risk of exposure to COVID-19.

The majority of participants 80 (97.6%) general practitioners choose COVID-19 as an virus infectious disease (Table 4). Most of the participants believed that COVID-19 caused by the SARS-cov-2 virus (Table 5). Six hundred eight (91.9%) of the participant believed that loss of taste and smell sensation associated with COVID-19 infection (Table 6). The majority of participants 80 (97.6%) identified who should be tested for corona virus including all symptomatic individuals who have undertaken recent international travel A close contact of COVID-19 patient, having fever, cough and cold Asymptomatic symptoms of COVID-19 children (Table 7). 65(79.3%) participant of general practionaer, 51 (68.9%) of post graduate student and 41 (64.1%) of under graduate student thought that health care worker should take precaution for prevention from suspected patient such as close interaction with every patient and take airborne precautions (Table 8). To diagnose COVID- 19 the laboratory test such as RT-PCR and rapid antigen test was identified by 18 (28.1%) of UG student, 16 (19.5%) of GP and 12(16.2%) of PG students (Table 9). Among all these participants 58(70.7%) of GP, 50 (67.6%) of PG students and 34(53.1%) of UG students believed that yellow color coded bag use for disposal of PPE (Table 10). Majority of the participants 73 (89%) of GP identified the correct range of oxygen saturation (95-100%) (Table 11). 38(46.3%) of GP, 37 (50%) of PG student and 37(57.8%) of UG student thought that dental procedures such as Scaling and root planning using ultrasonic devices, Cavity preparation using high speed airoter, cementation of crown using rubber dam kit should not be carried out in COVID-19 suspected individuals (Table 12). If patient suspected or confirmed with COVID-19, the 64(78%) of GP, 57 (77%) of PG student and 48(75%) of UG student choose a use of telecommunication medium and advice pharmaceuticals if the treatment can be delayed (Table 13). A 62(75.6%) of GP, 57(77%) of

PG student and 47 (73.4%) of UG student considered, Hand scaling and abscess drainage using hand scalers at the site of interest, Cavity preparation and access opening using low speed micromotor, Unavoidable extraction procedures should be carried out (Table 14).

Normal oxygen saturation level after 6 min walk is <80% and only 11(17.2%) of UG student, 3(4.1%) of PG student and 6(7.3%) of GP identified the correct answer while others believed that it is <90% oxygen level after 6min walk (Table 15).

Table 1: Age distribution.

	Mean	S.D	S.E.	Minimum	Maximum
AGE (in years)	25.74	4.39	0.29	20.0	58.0

Table 2: Gender Distribution.

(N=220)	Frequency (n)	Percentage (%)
Male	52	23.6%
Female	168	76.4%
Chi square test value = 61.164, p <0.001**		

*p<0.05 – significant difference

Table 3: Designation.

(N=220)	Frequency (n)	Percentage (%)
Under Graduate	64	29.1%
Post-Graduate	74	33.6%
General practitioner	82	37.3%
Chi square test value = 2.218, p =0.330		

*p<0.05 – significant difference

Table 4: Which of the following is COVID-19?

(N= 220)	UG (N=64) n (%)	PG (N=74) n (%)	GP (N=82) n (%)
A viral infectious diseases	63 (98.4%)	71 (95.9%)	80 (97.6%)
A bacterial infectious diseases	1 (1.6%)	3 (4.1%)	2 (2.4%)
A fungal infectious diseases	0 (0%)	0 (0%)	0 (0%)
A prion induced infectious diseases	0 (0%)	0 (0%)	0 (0%)
Chi square test value = 0.844, p = 0.656			

*p<0.05 – significant difference **p<0.001 – highly significant

Table 5: COVID-19 is caused by which of the following virus.

(N= 220)	UG (N=64) n (%)	PG (N=74) n (%)	GP (N=82) n (%)
SARS-CoV-2	52 (81.2%)	67 (90.5%)	76 (92.7%)
SARS-CoV	11 (17.2%)	5 (6.8%)	4 (4.9%)
MERS-CoV	0 (0%)	2 (2.7%)	0 (0%)
MERS-CoV-2	1 (1.6%)	0 (0%)	2 (2.4%)
Chi square test value = 12.904, p = 0.045*			

*p<0.05 – significant difference **p<0.001 – highly significant

Table 6: Which of these is one of the clinical symptoms associated with the COVID_19 infections.

(N= 220)	UG (N=64) n (%)	PG (N=74) n (%)	GP (N=82) n (%)
Tooth Ache	0 (0%)	0 (0%)	0 (0%)
Leg Cramp	0 (0%)	0 (0%)	0 (0%)
Whooping Cough	17 (26.6%)	6 (8.1%)	14 (17.1%)
Loss of taste & smell sensation	47 (73.4%)	68 (91.9%)	68 (82.9%)
Chi square test value = 8.361, p = 0.015*			

*p<0.05 – significant difference **p<0.001 – highly significant

Table 7: Who should be tested for corona virus.

(N= 220)	UG (N=64) n (%)	PG (N=74) n (%)	GP (N=82) n (%)
All symptomatic individuals who have undertaken recent international travel	0 (0%)	0 (0%)	2 (2.4%)
A close contact of COVID-19 patient, having sever cough and cold	0 (0%)	1 (1.4%)	0 (0%)
Children of COVID-19 patient without any symptoms	0 (0%)	0 (0%)	0 (0%)
All of the above	64 (100%)	73 (98.6%)	80 (97.6%)
Chi square test value = 5.361, p = 0.252			

*p<0.05 – significant difference **p<0.001 – highly significant

Table 8: Which of these is one of the types of precautions that need to be taken by the health care workers for prevention from suspected patients at triage.

(N= 220)	UG (N=64) n (%)	PG (N=74) n (%)	GP (N=82) n (%)
Close interaction with every patient	7 (10.9%)	0 (0%)	2 (2.4%)
Airborne precautions	15 (23.4%)	18 (24.3%)	13 (15.9%)
None of the above	1 (1.6%)	5 (6.8%)	2 (2.4%)
Both A and B	41 (64.1%)	51 (68.9%)	65 (79.3%)
Chi square test value = 16.838, p = 0.01*			

*p<0.05 – significant difference **p<0.001 – highly significant

Table 9: What is the laboratory test available to diagnose COVID-19.

(N= 220)	UG (N=64) n (%)	PG (N=74) n (%)	GP (N=82) n (%)
RT-PCR (Reverse Transcription Polymerase Chain Reaction)	18 (28.1%)	12 (16.2%)	16 (19.5%)
Rapid Antigen Test	2 (3.1%)	1 (1.4%)	1 (1.2%)
Both of the above	44 (68.6%)	61 (82.4%)	65 (79.3%)
Chi square test value = 4.2, p = 0.380			

*p<0.05 – significant difference **p<0.001 – highly significant

Table 10: Which color coded bag is used for the disposal of PPE.

(N= 220)	UG (N=64) n (%)	PG (N=74) n (%)	GP (N=82) n (%)
Yellow	34 (53.1%)	50 (67.6%)	58 (70.7%)
Red	19 (29.7%)	9 (12.2%)	17 (20.7%)
Black	11 (17.2%)	12 (16.2%)	7 (8.5%)
Green	0 (0%)	3 (4.1%)	0 (0%)
Chi square test value = 15.478, p = 0.017*			

*p<0.05 – significant difference **p<0.001 – highly significant

Table 11: Which amongst the following is the normal range of oxygen saturation.

(N= 220)	UG (N=64) n (%)	PG (N=74) n (%)	GP (N=82) n (%)
95-100%	50 (78.1%)	64 (86.5%)	73 (89%)
91-94%	12 (18.8%)	8 (10.8%)	7 (8.5%)
88-90%	0 (0%)	2 (2.7%)	2 (2.4%)
88%	2 (3.1%)	0 (0%)	0 (0%)
Chi square test value = 10.312, p = 0.112			

*p<0.05 – significant difference **p<0.001 – highly significant

Table 12: Which of the following dental procedures can be carried out in COVID-19 suspected patients.

(N= 220)	UG (N=64) n (%)	PG (N=74) n (%)	GP (N=82) n (%)
Scaling and root planning using ultrasonic devices	2 (3.1%)	0 (0%)	4 (4.9%)
Cavity preparation using high speed airoter	3 (4.7%)	0 (0%)	0 (0%)
Cementation of crown using rubber dam kit	22 (34.4%)	37 (50%)	40 (48.8%)
None of the above	37 (57.8%)	37 (50%)	38 (46.3%)
Chi square test value = 13.983, p = 0.03*			

*p<0.05 – significant difference **p<0.001 – highly significant

Table 13: What will you do to treat a dental case of a COVID-19 confirmed or suspected patient?

(N= 220)	UG (N=64) n (%)	PG (N=74) n (%)	GP (N=82) n (%)
Use telecommunication medium advice pharmaceuticals if treatment can be delayed	48 (75%)	57 (77%)	64 (78%)
Refer the patient to the medical setup directly	12 (18.8%)	15 (20.3%)	16 (19.5%)
Directly examine the patient in your dental office for the treatment without knowing its severity	4 (6.2%)	2 (2.7%)	2 (2.4%)
Chi square test value = 1.788, p = 0.775			

*p<0.05 – significant difference **p<0.001 – highly significant

Table 14: Which of the emergency procedures that can be carried out in dental office during this COVID-19 pandemic.

(N= 220)	UG (N=64) n (%)	PG (N=74) n (%)	GP (N=82) n (%)
Hand scaling and abscess drainage using hand scalers at the site of interest	4 (6.2%)	8 (10.8%)	4 (4.9%)
Cavity preparation and access opening using low speed micromotor	2 (3.1%)	0 (0%)	2 (2.45%)
Unavoidable extraction	11 (17.2%)	9 (12.2%)	14 (17.1%)
All of the above	47 (73.4%)	57 (77%)	62 (75.6%)
Chi square test value = 4.974, p = 0.547			

*p<0.05 – significant difference **p<0.001 – highly significant

Table 15: Which amongst the following is the oxygen saturation level after 6 min walk.

(N= 220)	UG (N=64) n (%)	PG (N=74) n (%)	GP (N=82) n (%)
>80%	11 (17.2%)	19 (25.7%)	1 (1.2%)

<80%	27 (42.2%)	35 (47.3%)	49 (59.8%)
>90%	11 (17.2%)	3 (4.1%)	6 (7.3%)
<90%	15 (23.4%)	17 (23%)	26 (31.7%)
Chi square test value = 27.927, p < 0.001**			

*p<0.05 – significant difference **p<0.001 – highly significant

DISCUSSION

COVID-19 is a highly infectious disease requiring strict infection control measures. To decrease the spread of the disease among the community and dental healthcare providers, a high level of knowledge is crucial and must be obtained. In this study, the level of knowledge was examined among a sample of general practitioner, undergraduate student and post graduate student. Among the findings of all participants, an adequate level of knowledge was found in general practitioner and post graduate student and lack of knowledge found in undergraduate student. These findings are comparable to the results reported by Khader, et al., in their study among Jordanian dentists.^[18] Another finding in our report that was contradictory to the Khader, et al., report was that participants in our study acknowledged that dentists are at a high risk of exposure to COVID-19 and that it poses a serious threat while in the Khader, et al., report they perceived COVID-19 as moderately dangerous.^[18] The difference in findings is most likely to the difference in timing of administration of questionnaire as ours was completed at a later date and our participants were exposed to more information. In this study, participants' knowledge varied regarding the color coded bag used for disposal of the PPE kit, which is a yellow color bag used. Almost all participants knew the laboratory test available to diagnose COVID-19 which is RT-PCR and rapid antigen test. More than half of the GP participants think that what are the emergency procedures can be carried out in the dental office during this COVID-19 pandemic which is supported by the

CDC recommendation of adding additional precautions including the surgical mask (N95) to the personal protective equipment. The majority of the participants believe only urgent dental management can be provided to suspect COVID-19 patients, exhibiting great knowledge of the recent ADA recommendation of postponing any elective treatment for the safety of the patients and the staff. There is a general difference between responses made by juniors (students and interns) and the more experienced GP and PG students. The differences may be attributed to the fact that management of similar situations such as the COVID-19 pandemic is lacking in dental curriculums and was obtained from other sources. The importance of such findings is detrimental to future pandemics for both undergraduates and dental professionals. It emphasizes the need for pre-pandemic preparation through post-graduate training and dental curricular courses.

CONCLUSION

Participants lacked the knowledge in managing COVID-19, especially at the undergraduate level. However, the more efficient and appropriate response to future pandemics, dental curriculums, and educational activities should pro-actively provide training opportunities.

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ASSESSMENT OF KNOWLEDGE AND AWARENESS ABOUT COVID-19 AMONG DENTAL PRACTITIONERS-- A CROSS-SECTIONAL STUDY

The concern regarding coronavirus is increasing and new cases are emerging all over the world. As a group of researchers, we are doing a short (<5min) survey to assess the level of knowledge that we have about coronavirus. We request your kind support to participate in this survey and also recommend your colleagues in Saudi Arabia to participate in it. This survey is anonymous; the information you provide is only for educational and research purposes and it will be treated confidentially. Your participation is highly appreciated.

Which of the following is COVID-19?*

- A. viral infectious diseases
- B. bacterial infectious diseases
- C. fungal infectious diseases
- D. prion induced infectious diseases

COVID-19 is caused by which of the following virus?*

- A. SARS-CoV-2
- B. SARS-CoV
- C. MERS-CoV
- D. MERS-CoV-2

Which of the following is clinical symptoms associated with the COVID-19 infections?*

- A. Tooth ache
- B. Leg cramp
- C. Whooping Cough
- D. Loss of taste and smell sensation

<p>Who should be tested for corona virus?*</p> <p>A. All symptomatic individuals who have undertaken recent international travel</p> <p>B. A close contact of COVID-19 patient, having fever, cough and cold</p> <p>C. Asymptomatic symptoms of COVID-19 children</p> <p>D. All of the above.</p>
<p>Which of the following is the type of precautions that need to be taken by the health care workers for prevention from suspected patients at triage?*</p> <p>A. Close interaction with every patient.</p> <p>B. Airborne precautions</p> <p>C. None of the above</p> <p>D. Both A and B</p>
<p>What is the laboratory test available to diagnose COVID-19?*</p> <p>A. RT-PCR (Reverse Transcription Polymerase Chain Reaction)</p> <p>B. Rapid Antigen Test</p> <p>C. Both of the above</p> <p>D. None of the above.</p>
<p>Which color coded bag is used for the disposal of PPE?*</p> <p>A. Yellow</p> <p>B. Red</p> <p>C. Black</p> <p>D. Green</p>
<p>Which of the following is the normal range of oxygen saturation?*</p> <p>A. 95-100%</p> <p>B. 91-94%</p> <p>C. 88-90%</p> <p>D. <88%</p>
<p>Which of the following dental procedures can be carried out in COVID-19 suspected patients?*</p> <p>A. Scaling and root planning using ultrasonic devices</p> <p>B. Cavity preparation using high speed airoter</p> <p>C. Cementation of crown using rubber dam kit</p> <p>D. None of the above.</p>
<p>What will you do to treat a dental case of a COVID-19 confirmed or suspected patient?*</p> <p>A. Use telecommunication medium advice pharmaceuticals if treatment can be delayed.</p> <p>B. Refer the patient to the medical setup directly.</p> <p>C. Directly examine the patient in your dental office for the treatment without knowing its severity</p> <p>D. None of the above.</p>
<p>Which of the emergency procedures that can be carried out in dental office during the COVID-19 pandemic?*</p> <p>A. Hand scaling and abscess drainage using hand scalers at the site of interest.</p> <p>B. Cavity preparation and access opening using low speed micromotor.</p> <p>C. Unavoidable extraction.</p> <p>D. All of the above.</p>
<p>While treating dental patients during this COVID-19 pandemic, which of the following points should be kept in mind?*</p> <p>A. Identification and assessment of the dental major problem</p> <p>B. Infection control measure and self-protection.</p> <p>C. Postpone elective dental procedures and promote pharmacological management.</p> <p>D. All of the above</p>
<p>Which amongst the following is the oxygen saturation level after 6 min walk?*</p> <p>A. >80%</p> <p>B. <80%</p> <p>C. >90%</p> <p>D. <90%</p>

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