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Perception, knowledge and attitude on evolving phase of dentistry in covid-19 scenario among dental health professionals: a cross- sectional online questionnaire survey

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Abstract

The routes of transmission of COVID-19 through respiratory droplets, close contact or aerosol production in the dental practice is the major concern and there is a high risk of cross-infection. It is necessary to understand the knowledge and behavior if we effectively address the pandemic situation.

Aim & Objectives: To assess the the symptoms/signs, the protective measures, the level of awareness, and perception regarding the COVID-19 outbreak among practicing dental health professionals.

Material & Methods: A cross-sectional study was conducted on 300 practicing dentists in clinics, hospital and dental colleges in Tri City (Chandigarh, Panchkula and Mohali). A self-administered two-part questionnaire comprising of a series of questions on demographic analysis (individual, age, gender, qualification and work place characteristics) and the questionnaire consisted of knowledge about COVID-19 like incubation period of the

virus, mode of transmission, symptoms of the disease, infection control measures for preventing COVID- 19 were distributed through electronic media.

Results: Among the dentists who participated in the study, 28.6% were males and 71.4% were females, the maximum number of dentists were in the age group of 25–50 years and 25.7% held a master degree and 42.4% were dental practitioners. Over one third of dental professionals believed that it was necessary for both patients and doctor to wear masks and wash hands before getting in the dental chair to decrease disease transmission.

Conclusion: Medical and dental healthcare industry may have to face long term implications in future of this outbreak in terms of operational challenges. Due to rapidly evolving situation, further assessment of the implications of COVID-19 outbreak in dental practices is needed.

Keywords: COVID-19 infection; protective measures; awareness; infection control

Introduction

The coronavirus disease (COVID-19) is a newly discovered viral infection that started in Wuhan City, Hubei Province, China and caused the outbreak of pneumonia in the whole world.¹ Coronavirus disease (2019) is defined as illness caused by a novel coronavirus now called Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) formerly called 2019nCoV. It was initially reported to the WHO on December 31, 2019. This virus structurally comprises of a large, single, plus-stranded RNA as its genome.² A total of 4 genera of coronaviruses have been discovered to date and these are: α - CoV, β -CoV, γ -CoV, and δ -CoV.³ The α -CoV and β -CoV variants are observed to infect mainly the respiratory, gastrointestinal and central nervous system of humans and/or mammals, whereas γ -CoV and δ -CoV have been reported with reference to the infections limited to bird species.⁴ The most common serious manifestation of COVID-19 appears to be pneumonia. Some patients may have aches and pains, nasal congestion, runny nose, sore throat or diarrhea. A complete or partial loss of the sense of smell (anosmia) has been reported as a potential history finding in patients eventually diagnosed with COVID-19.⁵ A suggested route of human-human transmission is believed to occur via respiratory droplets from coughing and sneezing. Virus released in respiratory secretions can infect other individuals via direct contact with mucous membranes⁶. Dental professionals appear, indeed, at high risk of contagion due to the exposure to saliva, blood, and aerosol/droplet production during the majority of dental procedures. SARS-nCoV-2 transmission in dental settings occurs through following major routes:

(1) Direct exposure to respiratory secretions containing droplets, blood or saliva;

(2) Indirect contact with contaminated surfaces or instruments;

(3) Mucosal contact with infection-containing droplets and aerosols that are propelled by coughing and talking without a mask.

Therefore, being a Front-line Dentists and Dental Practitioners facing the greatest coronavirus exposure risk along with more chances of risk of cross infection.⁷ The practical guidelines recommended for Dental Professionals by the Centres for Disease Control and Prevention (CDC), the American Dental Association (ADA), and the World Health Organization to control the spread of COVID-19 include PPE kit, detailed patient evaluation and screening, pre-procedural mouth rinses, hand washing, anti-retraction handpiece and disinfection of the clinic.^{8,9} Hence, the present study was undertaken with the aim of assessing the basic essential knowledge, attitude and practice of Dental Health Professionals regarding the COVID-2019 outbreak.

Materials and Methods

The present study was a descriptive cross-sectional (questionnaire) study. The study population consisted of dental health professionals, specialized dental practitioners in different specialties of dentistry who are engaged in private practice in Tri City. List of all Private Dental Practitioners of the Tri City was obtained from Local Indian Dental Association (IDA) bodies through email. The study was conducted among 300 dentists (both males and females) from May 2020 to July 2020 and duration of study was three months.

Questionnaire survey

The main instrument to collect data was an online questionnaire using Google forms. The questionnaire was designed to measure knowledge about COVID-19 including clinical characteristics, transmission, prevention and infection control in Dental Clinics. The survey was a structured multiple-choice questions divided into two sections. Section I included an informed consent statement

that described the participation was voluntary and by clicking on a "YES" option, participants were informed that they were providing consent to complete the survey. Section II comprised of 25 questions depicting demographic analysis (age, gender, qualification, workplace), knowledge and awareness regarding COVID-19 (common symptoms, mode of transmission, various preventive measures, details of hygiene practices etc.). Also, questions discussed about dental students and dental practitioner's attitude towards this pandemic, how much admissions in dental colleges would be affected and impact of COVID-19 in the field of dentistry. The questionnaire was delivered to the study subjects via Social Media Application and not handed over personally because of city 'Lockdown' to prevent the spread of the virus. All data was collected and analyzed by multiple logistic regression analysis using SPSS software, version 20 ($\alpha = 0.05$).

Results

Participant's Characteristics

Out of 300 study subjects a total of 210 responded positively by participating in this study. In this way the response rate was 70.0%. Rest of the subjects either didn't participate or didn't complete the questionnaire. This study included a total of 210 (150 females and 60 males) dentists, forming a response rate of about 70.0% (210 participated out of 300 invited dentists). Their age ranged from 25-50 years with a mean of 37.5 years.

The participant's characteristics are shown in Table 1. A total of 54 (25.7%) had completed a Postgraduate Program in Dentistry, 67 (31.9%) had completed an Undergraduate Program in Dentistry, 89 (42.4%) were Private Practitioners in Dentistry. The participants working in recognised dental college was 84 (40%), 27 (12.9%) was in hospitals and 99 (47.1%) were practising Dentistry in Dental Clinics.

Table 1: The characteristics of the 210 dentists enrolled in the study.

Variable	Dentists	n (%)
Age Group		
< 30 yrs	133	63.3%
30-45 yrs.	61	29%
> 45 yrs.	16	7.6%
Gender		
Male	60	28.6%
Female	150	71.4%
Qualification		
Undergraduate	67	31.9%
Postgraduate	54	25.7%
Practitioner	89	42.4%
Workplace		
College	84	40%
Hospital	27	12.9%
Clinic	99	47.1%

Awareness about COVID-19 Infection

When asked about the incubation period, over one-third of dentists correctly reported 1-14 days. The percentage of dentists who reported the different symptoms of the COVID-19 infection are shown in Table 2. The majority reported fever and cough, sneezing and difficulty in breathing as symptoms. Headache, fatigue, and drowsiness were reported by 2.9% of dentists. Ulcers, Fever, Nausea, Vomiting were not reported by any of the participants. Over one-third of the dentists reported that patients with COVID-19 infection may present with fever and cough, sneezing and difficulty in breathing as symptoms. When they were asked about aspects that should be considered to identify patients at risk of having COVID-19, 136 (64.8%) mentioned the source of transmission of COVID-19 may be aerosol production during dental procedures, and 55 (26.2%) were not sure about the source of transmission of COVID-19 was

aerosol. In addition, most dentists correctly reported known modes of transmission (Table 2).

Table 2: Dentist's Awareness about incubation period, symptoms, and mode of transmission of the coronavirus disease infection (N=210)

Questionnaire		n %
1. Proper knowledge about COVID-19 and its precautions to be taken in a dental practice		
Yes		
No	173	82%
May be	0	0%
2. Incubation period of COVID-19 infection	18	18%
2-7 days		
1-14 days	11	5.2%
1-21 days	182	86.7%
3. Major symptoms of COVID-19 disease	17	8.1%
Headache, Fever, Drowsiness, Fatigue		
Coughing, Sneezing, Fever, Difficulty in breathing	6	2.9%
Ulcers, Fever, Nausea, Vomiting	204	97.1%
4. Aerosols must be the source of transmission for COVID-19	0	0 %
Yes		
No	136	64.8%
Not sure	19	19%
	55	26.2%

Awareness of Measures for Preventing COVID-19 Transmission in Dental Clinics, Hospitals and Dental Colleges

The majority of dentists (90%) agreed that it was possible for dentists to spread awareness regarding COVID-19, and that hand hygiene and personal protective equipment (PPE) were highly effective to prevent infection from patients with known or suspected COVID-19. The percentages of dentists who reported other specific measures are shown in Table 3. Almost all dentists (n=210, 71.0%) reported that it is important to use both N-95 masks and gloves, 65.7% dentists agreed to use PPE kit and surgical gown regularly to decrease the possibility of transmitting infections to patients and to themselves. In addition, 76.2% dentists agreed for infrared thermometer thermal screening which is the first step in diagnosing and for detection of COVID-19 infection. 94.6% dentists agreed for rapid testing kit mandatory for dentist so that they can test the patient before consulting them.

Table 3: Dentist's Awareness of Measures for the prevention of coronavirus disease transmission in Dental Clinics, Hospital and Dental Colleges (N=210).

Questionnaire		Dentists	n %
1.	Taking adequate measures like checking the temperature, taking the travel history & medical		
	history & getting the appropriate declaration/consent form signed before treating a patient?		
	Yes		
	No	197	94%
	Sometimes	0	0%
2.	Using infrared thermometer for detection of COVID-19 patients is an important measure in	13	6%
	clinics and hospitals?		
	Yes		
	No	160	76.2%
	May be	18	8.6%
3.	Appropriate to prevent the cross-infection of COVID-19 in day to day activities?	32	15.2%
	Surgical masks		
	N-95 masks		
	Cotton cloth masks	42	20%
4.	Heard about N-95 mask before this outbreak?	149	71%
	Yes	19	19%
	No		
	May be		
5.	Facing any difficulty while doing patients wearing PPE Kit and N-95 mask?	117	55.7%
	Yes, a lot	80	38.1%
	No	13	6.2%
	It's Fine		
6.	Wearing a PPE kit is the only protection barrier while doing the patient or high GSM		
	surgical gown is also sufficient enough?	127	60.5%
	PPE Kit	6	2.9%
	Surgical Gown	77	36.7%
	Both		
7.	Having a rapid testing kit be made mandatory for a dentist so that they can test the patient		
	before consulting them?	45	21.4%
	Yes	27	12.9%
	No	138	65.7%
8.	After following all the precautions do you still prefer to do aerosol generating procedures?		

Yes		
No	199	94.6%
May be	11	5.4%
9. Do you feel safe in PPE kit while doing diagnosis or treating any patient?		
Yes	60	28.6%
No	94	44.8%
May be	56	26.7%
	125	9.5%
	38	18.1%
	47	22.4%

Impact of COVID -19 transmission on admission of undergraduate and postgraduate level in Dental Colleges Professionals and Practitioners agreed that the COVID-19 infection have a strong impact on clinical work of Undergraduate and Postgraduate students and affect the admissions in recognized Dental Colleges respectively.

COVID-19 pandemic infection which affects all worldwide population might have an impact on all levels of profession especially dentistry (Dental Clinics, Hospitals and Dental Colleges). 48.6% and 58.6% Dental

Table 4: Impact of COVID-19 transmission on admission and clinical work in Dental Colleges (N=210).

Qu	estionnaire	Dentists	n %	
1.	Will the present fear of COVID-19 affect the Undergraduate or Postgraduate			
	students clinical work in colleges?			
	Strongly disagree	2	1%	
	Disagree	1	0.5%	
	Neutral	20	9.5%	
	Agree	102	48.6%	
	Strongly agree	85	40.5%	
2.	Fear of COVID-19 would affect the admissions at Undergraduate and			
	Postgraduate level in Dental Colleges?			
	Yes	123	58.6%	
	No	29	13.8%	
	May be	58	27.6%	
Atti	Attitude towards dental practice with COVID-19 World Health Organization (WHO) and Centre for disease			

Attitude towards dental practice with COVID-19

Control (CDC) of disinfection and safety measures along

More than half (n=210, 61%) of dental practitioners are facing difficulty in following the guidelines given by

with record maintenance. The major challenge for Dental

Page 2.

Professionals is the asymptomatic cases of COVID-19 and 99% of Dental Professionals agree to it. The fear and anxiety factor during diagnosis and increased expenditure Table 5: Impact of COVID-19 pandemic transmission on D in Dental Clinics along with recovery rate is the major challenge and has a strong impact on the profession of dentistry.

Table 5: Impact of COVID-19 pandemic transmission on Dental Practice (N=210).

Questionnaire		Dentists	n %
1.	How much difficulty dentists are facing in following the guidelines of disinfection, protection		
	and record maintenance?		
	Not much	55	26.2%
	Moderate	128	61%
	Very much	27	12.9%
2.	The present increased expenditure done in dental clinics due to the respective guidelines would		
	be easily recoverable?		
	Yes	29	13.8%
	No	106	50.5%
	May be	75	35.7%
3.	Anxious when doing diagnosis or providing treatment to a patient?		
	Yes	128	61%
	No	42	42%
	May be	40	40%
4.	Dentists want to close their practice until the number of COVID-19 cases starts declining?		
	Yes		
	No	92	43.8%
5.	An asymptomatic COVID-19 cases are a major challenge in the practice of dentistry?	118	56.2%
	Yes		
	No		
6.	Impact of COVID-19 scenario in the field of dentistry?	208	99%
	(i) The impact would be for longer term & recovery would be slow.	2	1%
	(ii) The impact would be till fear is there, clinicians will soon come back to older ways.		
	(iii) The practice of dentistry would be changed forever	105	50%
		32	34.8%
		73	15.2%

Discussion

This online survey provides an insight on the level of awareness, perception, attitude and knowledge of Indian dentists on infection control with special emphasis on COVID-19 at the time of the outbreak in 2020. It was observed in the study that the majority of the participants had a fair knowledge regarding COVID-19 and there were noteworthy deficiencies in some of the important aspects. Females were predominant in this sample. This might be explained because the number of female dentists in Tri City is higher than the number of male dentists based on database of Dental Council of India. Similar study was conducted on gender distribution by Prasanna et al. (2015) in which 50% females are in the dental practice as well in Dental Colleges¹⁰. The estimated incubation period of COVID-19 is upto 14 days. In our study, 86.7% dentists had the knowledge about the incubation period of the disease and it is essential to know the right incubation period because of its role in determining the safe period to treat suspected patients¹¹. However, it is imperative for the dentist to carry on with preventive measures for all their patients all the time¹².

Recent research has observed that COVID-19 patients are both symptomatic and asymptomatic. The asymptomatic patients carry this particular type of virus which can lead to disease transmission¹³. In the present study, 97.1% dentists agreed that coughing and sneezing along with difficulty in breathing are the major symptoms of COVID-19 patients. Dental students and health professionals might encounter such patients and will have to act diligently not only to provide dental care but at the same time prevent nosocomial spread of the infection¹².

Almost all the dentists agreed that hand hygiene and wearing PPE kits are effective ways in preventing COVID-19. The threat of any epidemic makes all health care providers alerted, as they are at high risk of contacting infection and it is the nature of their work to selflessly treat their patients. The use of PPE, like mask (N-95 masks, Gloves, Surgical gown, Goggles and face-shield) is recommended by WHO and CDC to protect skin and mucosa from infected blood or respiratory secretions¹². Appropriate use of all these precautionary measures significantly reduces the risk of viral transmission¹³. More than 70% of dentists in the present study were aware of the use of PPE kit which is similar to the findings of some other studies conducted on COVID-

19. Subjects who hold Post-Graduate degree and Dental Professionals have more knowledge as compared to Undergraduate Students who shows a positive impact of education on knowledge, perception and awareness regarding COVID-19. The reason might be that Post-Graduate studies involve performing some kind of Research (thesis) and updating the Dentist's knowledge based on preset guidelines and Evidence-Based Practice¹⁴. Moreover, COVID-19 pandemic state may have an impact on the admissions well as on the clinical work of the students (UG and PG level) in recognized Dental Colleges. The result of present study strongly agreed on this fact that COVID-19 has caused many difficulties for Dental Educators providing an opportunity to the students to modernize their new approaches via digital apps and students might be academically sound but they may lack in clinical knowledge. The present study had few limitations as well. The sample size in this study is small because the whole city is under lockdown due to panic created by the pandemic keeping the people home bound. Moreover, the study relied upon self-reported data which is dependent on subject, honesty and recall ability. Thus, it may give rise to recall bias.

Conclusion

Coronavirus pandemic has challenged every sector of the society to mend their ways of functioning but in particular Health Care Professionals have to deal with the symptomatic patients to provide emergency care or asymptomatic patients for routine care. Dentists are at high risk of getting exposed to virus and pathogenic microorganisms due to the specificity of the profession, which includes face-face communication, dealing with saliva, blood, body fluids and handling infected instruments or contaminated surfaces. In the present scenario, it is prudent for all the Dental Professionals to adopt certain guidelines for everybody's safety.

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