

## Awareness, Perception, and Attitude Regarding COVID-19 and Infection Control among dentists: Web-based Cross-Sectional Study

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### Abstract:

**Background:** Many dental clinics lack the minimum requirements for infection control. Although available preventive guidelines and infection control measures are readily available. This becomes very important during pandemic like COVID-19.

**Aim:** Aim of this study is to assess the level of awareness, perception, and attitude regarding the COVID-19 pandemic and infection control among dentists through web-based questionnaire.

**Methods:** Participants from all over the India consisted of dentists who worked in private clinics, hospitals, and health centers were enrolled. An online questionnaire was sent to participant, comprised of total 42 questions about dentists' general characteristics; their awareness about the symptoms of the disease, mode of transmission of COVID-19 and infection control measures; and their attitude toward treating patients with COVID-19 infection.

**Results:** This study included a total of 396 dentists (84.3% of participants belong to 20-29 age groups). Master or residency program in dentistry was completed by total of 142 (36%), 191 (48.5%) had received training in infection control in dentistry, and training or lectures regarding COVID-19 was attended by 102 (25.9%). Most of the participants were able to identify COVID-19 symptoms and patients at risk of having COVID-19, were able to correctly report known modes of transmission, and were aware of measures for preventing transmission of COVID-19.

**Conclusions:** Dentist of India are aware of COVID-19 in general. Its symptoms, mode of transmission, and infection control measures in dental clinics. More infection control training and disease outbreak program should be implemented in day to day dental practice.

**Keywords:** COVID-19, Coronavirus, Pandemic, Infection control, Awareness.

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### I. Introduction

On March 11, 2020 World Health Organization (WHO) declared a global public health emergency against the outbreak of Coronavirus disease, which is termed as Coronavirus Disease 2019 (COVID-19)<sup>1</sup> and since then has rapidly achieved a pandemic status. The COVID-19 disease is a newly discovered viral infection that started in Wuhan, China and caused the outbreak of pneumonia in the rest of the world. A suggested route of human-to-human transmission is through airborne droplets, touching or coming into contact with an infected person or a contaminated surface.<sup>2</sup>

Similarly, A worldwide outbreak of severe acute respiratory syndrome (SARS) began in March 2003. This posed an unprecedented threat to our community and presented a great challenge to the healthcare professionals. Over 30% of those infected were healthcare workers and medical students, and eight frontline healthcare workers died.<sup>3</sup>

In developing and tourist-friendly countries, there is a boom of dental tourism due to the availability of quality treatment at affordable prices, which attracts patients from all over the world.<sup>4</sup> The dentist can be the first person to come in contact with an infected person in conditions like this; they can either become a carrier and infect others unknowably.<sup>5</sup> Dental emergencies can occur patients with COVID-19 and close contact would be unavoidable then.

Besides, period of the disease and the post-infection period make it challenging for dentist to recognize the existence of COVID-19 infections, which could increase the transmission of the disease during these periods. While the incubation period COVID-19 is yet unclear,<sup>6,7,8</sup> it is estimated to be consistent with that of SARS and Middle East Respiratory Syndrome (MERS).<sup>9</sup> Therefore, patients infected without showing any symptoms of COVID-19, 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.<sup>2</sup>

Medical comorbidities include diabetes, hypertension, cardiovascular diseases, chronic renal failure and chronic pulmonary disease are more common in MERS compared to SARS patients.<sup>10</sup> The clinical sign and symptoms of COVID-19 are predominantly shared by SARS and MERS.<sup>11,12</sup> COVID-19 patients predominantly present with mild symptoms, but those with comorbidities have worse clinical outcomes, which imposes greater stress and need of awareness among health care workers to fight against the outbreak.<sup>9</sup>

So to fight against such an outbreak, dentists also should be aware of recent developments, especially those related to public health, and by following proper guidelines make efforts to prevent the transmission of such diseases.<sup>5</sup> Implementation of sound prevention measures in dental practice and to increase the level of awareness among dentists is important. Hence, aim of this study is to assess level of awareness, attitude and perception toward COVID-19 and infection control among dentist.

## **II. Material And Methods**

This Web-based questionnaire Cross-Sectional Study had Participants from all over the India consisted of dentists who worked in private clinics, hospitals, and health centers were enrolled. An online questionnaire was sent to participant, comprised of total 42 questions.

**Study Design:** Web-based questionnaire Cross-Sectional Study

**Study Location:** Department of Periodontology, K.M.Shah Dental College and Hospital, Sumandeep Vidyapeeth.

**Study Duration:** may 2020 to oct 2020

**Sample size:** 384 participant

**Sample size calculation:** The sample size of the present study was estimated to be 384 at 95% confidence interval.

**Subjects & selection method:** The sample of dentists was selected randomly through email or Whatsapp groups for dentists. Participants invited to fill the form were twice the number of sample size calculated. To ensure that they are dentist and work in India, each participant was contacted individually. The participating dentists were asked to forward the questionnaire to their colleagues so that maximum participation could be ensured from different zonal divisions.

### **Inclusion criteria:**

1. Dentist all over the country including private practitioner, institutional level, PG student.

### **Exclusion criteria:**

1. UG students.
2. Not willing to take part in the survey.

### **Procedure methodology**

After This questionnaire survey was conducted after approval from SVIEC. Dentist all over the country including private practitioner, institutional level, Postgraduate students were included after obtaining consent to participate.

Participants were evaluated by web-based questionnaire. The questionnaire was formulated in English language and consisted of 41 questions. All the participants were chosen in accordance with the selection criteria defined. The sample of dentists was selected through convenient sampling randomly by email or whatsapp groups for dentists. Online generated link was forwarded to them to fill the questionnaire. Inform consent was taken in the online survey itself. Questions in this study were concerned of the following areas (i) Awareness (ii) Perception (iii) Attitude regarding COVID-19 and infection control. Once questionnaire had been filled by all the participants, data was entered in the Excel sheet and was subjected for statistical analysis.

The sample size of the present study was estimated to be 384 at 95% confidence interval. The sample of dentists was selected randomly through email or Whatsapp groups for dentists. Participants invited to fill the form were twice the number of sample size calculated. To ensure that they are dentist and work in India, each participant was contacted individually. The participating dentists were asked to forward the questionnaire to their colleagues so that maximum participation could be ensured from different zonal divisions.

The questionnaire was adopted from a previous study conducted by Khader Y *et al.*, 2020.<sup>2</sup> Using a prototype provided by Google Forms, a close-ended web based questionnaire was developed (Google Inc., USA). The Google Drive application was accessed from an existing Google account to design the online version of the questionnaires. A new Google Forms prototype as created after accessing the Google Drive application. All the questions were inserted into the Google Form prototype along with choices and were saved. The surveyor could access the link to the online questionnaire through a laptop and smartphone.

### Statistical analysis

In the present analysis, descriptive and inferential statistical analyses have been performed. Mean  $\pm$  SD results on continuous measurements were presented and categorical measurement results were presented in number (percent). The level of significance was set at  $p=0.05$  and it was assumed that any value less than or equal to 0.05 was statistically significant. The significance of research parameters on a categorical scale was found using the Chi square analysis. The IBM SPSS Statistics 20.0 Statistical Software (IBM SPSS Statistics 20.0)

### III. Result

This study included a total of 396 (259 females and 137 males) dentists. 84.2% of participants were < 30 age. 1-30 years of dental practice with a mean of 9.4 (SD 8.9) years was observed. The characteristics of participants' are shown in Table 1.

Over 85% of the participant reported fever, shortness of breath, sore throat and cough as symptoms. About 80% of dentists have confirmed that there could be no symptoms in patients with COVID-19 infection. In addition, most dentists correctly reported known modes of transmission and identify patient at risk of having COVID-19(Table 2).The percentages of dentists who reported other specific measures are shown in Table 3. Almost all dentists (99.2%) reported that it is important to change both masks and gloves regularly to decrease the possibility of transmitting infections to patients and to themselves. Different source from which patient gets information about the COVID-19 infection is mentioned in Fig1.

A total of 60.6% of dentists perceived COVID-19 as very dangerous. More than 53% of MDS and 66% BDS perceive COVID-19 as very dangerous which was statistically significant ( $p=0.013$ ). 71.4% of dentists in public sector, 54.5% those in academics and 46.6% of them in private sector strongly disagrees with the belief that COVID-19 is not currently a serious public health issue( $p=0.002$ ). Different aspects of Perception about COVID-19 and comparison to SERS and MERS are mentioned in (Table 4).

More than half (61.6%) of the dentists reported that COVID-19 symptoms often resolve with time and do not require any special treatment (Table5). More than 71.1% of students, 59.1% of dentist in private sector and around 40% dentist in public and academics sector agree with the statement that COVID-19 symptoms often resolve with time and do not require any special treatment, which was highly significant ( $p=0.008$ ). Dentist attitude regarding precautionary action in dental clinic is mentioned in (Fig 2). However, a total of 59.1% of dentists reported that they prefer to avoid working with a patient with a suspected case of COVID-19. Nearly 51.5% of dentist in academics, 45.8% of students, 40.4% of private sector and only 7.1% of public sectors have confidence in handling suspected COVID-19 patients to some extent and it was highly significant difference( $p<0.001$ ). Level of Confidence among the participants in handling suspected COVID-19 Patients is shown in (Fig.3). Dentist reported different attitude toward a patients sneezing or coughing in their clinic (Fig 4).

Tables

**Table 1.** The characteristics of the 394 dentists enrolled in the study

Variables	Dentist – n(%)
GENDER	
Female	245 (65.5%)
Male	123 (34.5%)
AGE (YEARS)	
<30	332 (84.2%)
$\geq 30$	62 (15.7%)
YEARS OF PRACTICE	
<5	185 (60.2%)
5-10	59 (29.7%)
>10	124 (10.1%)
REGION	
North	35 (8.9%)
Central	64 (16.2%)
Southern	62 (15.7%)
Western	198 (50.3%)
Eastern	22 (5.5%)

North eastern	13 (3.2%)
<b>HEALTH SECTOR</b>	
Academics	31(7.9%)
Private sector	207(52.5%)
Public sector	14(3.6%)
Student	142(36%)

**Table 2.** Dentists’ awareness about incubation period, symptoms, and mode of transmission of the coronavirus disease infection

Variable	Dentists, n (%)
<b>SYMPTOMS OF THE COVID-19 INFECTION</b>	
Fever	386(98%)
Cough	341 (86.5%)
Shortness of breath	348(88.3%)
Diarrhea	220(55.8%)
Vomiting	0
Runny nose	149(37.8%)
Sore throat	360 (91.4%)
Red eyes	82(20.8%)
Skin rash	77(19.5%)
Joint or muscle pain	152(38.6%)
May present with no symptoms	329(83.5%)
<b>MODE OF TRANSMISSION</b>	
Coughing and sneezing	362(91.1%)
Hand shaking	305(77.4%)
Touching surfaces such as doorknobs and tables	298(75.6%)
<b>PATIENTS AT RISK</b>	
Presence of symptoms of diarrhea	152(38.6%)
Presence of symptoms of a respiratory infection	330(83.85%)
History of travel	350(88.8%)
History of contact with possible infected patients	334(84.8%)

**Table 3.** Dentists’ awareness of measures for the prevention of coronavirus disease transmission in dental clinics

Measures for prevention	Dentists, n (%)
Routinely clean and disinfect surfaces in contact with known or suspected patient	351(89.1%)
All health staff members wear protective clothing	310(78.7%)
Put facemask on known or suspected patients	329(83.5%)
Frequently clean hands by using alcohol-based hand rub or soap and water	365(92.6%)
Avoid moving and transporting patients out of their area unless necessary	276(70.1%)
Place known or suspected patients in adequately ventilated single rooms	262(66.5%)

**Table 4.** Different aspect of perception of COVID-19

Variable	Dentists, n (%)
<b>PERCEPTION OF COVID-19</b>	
Very dangerous	240(60.6%)
Moderately dangerous	154(38.9%)
Not dangerous	2(0.5%)
<b>PERCEPTION OF COVID-19 COMPARED TO SARS</b>	
Less dangerous	95(24%)
More dangerous	222(56.1%)
The same	79(19.9%)
<b>PERCEPTION OF COVID-19 COMPARED TO MERS</b>	
Less dangerous	103(26%)
More dangerous	221(55.8%)
The same	72(18.2%)
<b>COVID-19 AS SERIOUS PUBLIC HEALTH ISSUE</b>	
Strongly disagree	176(44.45%)
Disagree	173(43.7%)
Neutral	26(6.6%)
Agree	10(2.5%)
Strongly agree	11(2.8%)

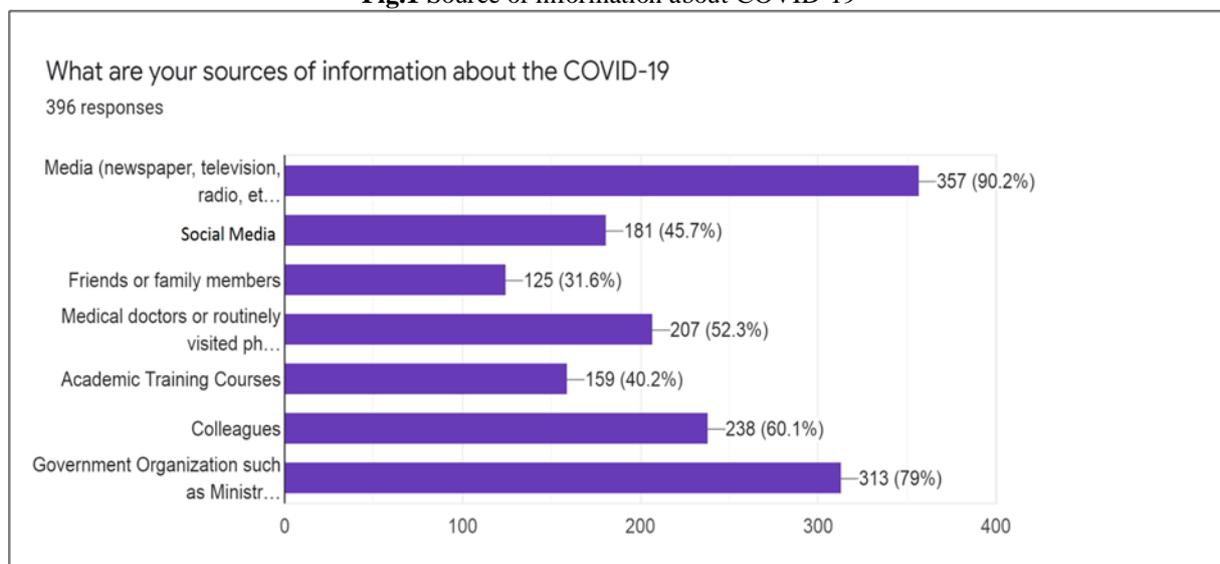
EDUCATING PEOPLE FOR PREVENTION IS IMPORTANT	
Yes	392(99%)
No	4(1%)

**Table 5.** Attitude toward COVID-19

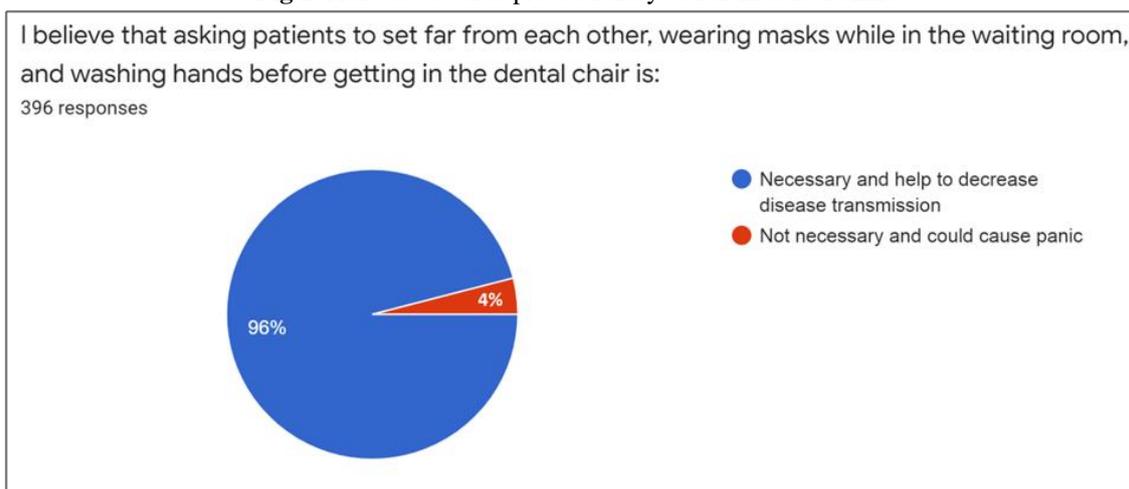
Variable	Dentists, n (%)
COVID-19 SYMPTOMS RESOLVE WITH TIME	
Yes	244(61.6%)
No	152(38.45)
AVOID WORKING WITH SUSPECT COVID-19 PATIENT	
Yes	234(59.1%)
No	162(40.9%)
DENTIST ROLE IN SPREADING INFORMATION ABOUT COVID-19	
Very significant	280(70.7%)
Moderately significant	103(26%)
Mildly significant	9(2.3%)
Not significant at all	4(1%)
KNOW WHOM TO CONTACT WHEN UNPROTECTED EXPOSURE OCCURS	
Yes	361(91.2%)
No	35(8.8%)
KNOW WHAT TO DO IF HAVE SIGN AND SYMPTOMS	
Yes	383(96.7%)
No	13(3.3%)
ALLOW YOUR DENTAL STAFF TO WORK WITH PATIENT HAVING FLU-LIKE SYMPTOMS	
Yes	170(42.9%)
No	226(57.1%)

Figure Title

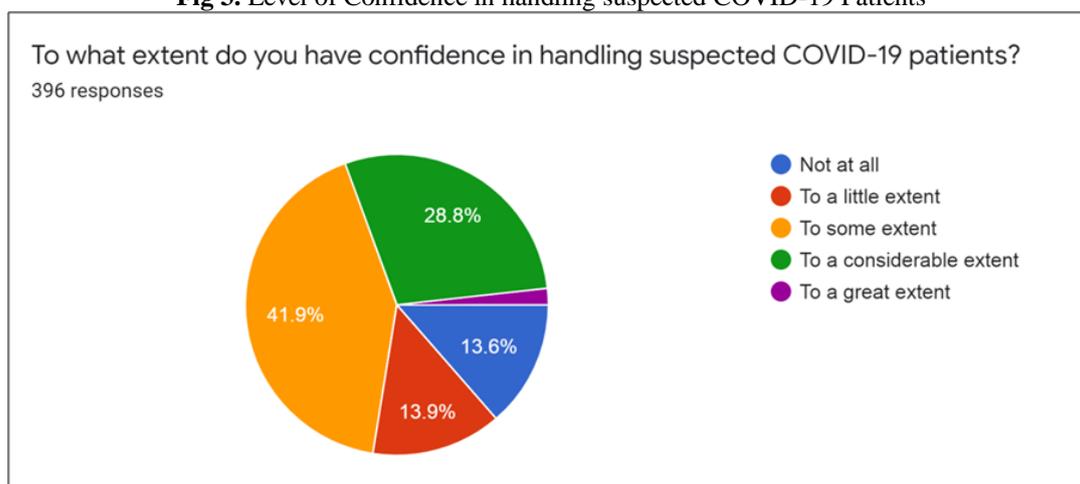
**Fig.1** Source of information about COVID-19



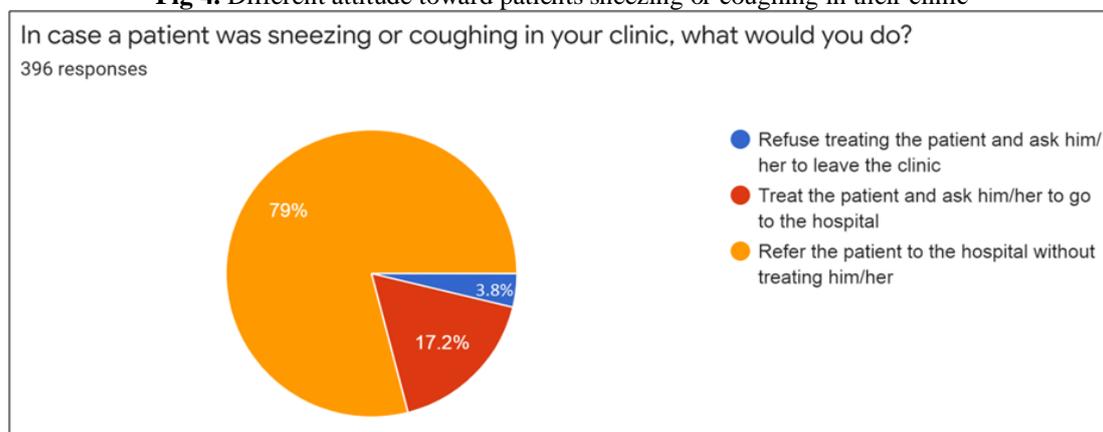
**Fig 2.** Attitude towards precautionary action in dental clinic



**Fig 3.** Level of Confidence in handling suspected COVID-19 Patients



**Fig 4.** Different attitude toward patients sneezing or coughing in their clinic



#### IV. Discussion

People who come in close contact or work near the patient with a COVID infected individual, poses a greater risk of transmission of COVID-19.<sup>5</sup> In this survey, the majority of dentists had good knowledge and were able to recognise the main symptoms of COVID-19, which allows dentists to understand the danger and take the appropriate steps and is considered important for monitoring and regulating the spread of the disease.<sup>13</sup> A multinational study (92.7%) performed by Kamate et al.<sup>5</sup> and another study conducted in Pakistan by Saqlain et al.<sup>14</sup> was comparable (93.2 % ). More than half (61.6%) of the dentists thought that disease self-resolve over

time with no special treatment. This perception about the disease self-resolution resulted in about half of the participants perceiving COVID-19 as moderately dangerous (38.9%).

The majority (99%) reported that education of people is important about COVID-19 to prevent the spread of the disease. Majority of participants (77.9%) never had any training or lectures regarding COVID-19 or such disease outbreaks. When comparing MDS and BDS, more number of MDS had training for such conditions. Even at BDS level such training program or lectures should be held for better education of the dentist in the fields. On sector wise comparison majority of dentists in public and academics sectors had training or lectures regarding COVID-19 when compared to private sectors and students. Showing that public sectors dentist are readily exposed to such condition and academician who usually had their own private clinic have more experiences in handling such outbreaks. Similarly, Ghambir et al.<sup>15</sup> and Sezgin et al.<sup>16</sup> reported that academicians and specialty dentist had higher knowledge scores in their studies.

Nearly all of the participants (85%) were aware of needed prevention for transmission of COVID-19. Such as good hand hygiene and the importance of thorough disinfection of all surfaces within the dental clinic, use of personal protective equipment, including masks, gloves, gowns, and goggles or face shields, and frequently changing both masks and gloves regularly to decrease the possibility of transmitting infections which are recommended for routine dental practice.<sup>8</sup> Which was in accordance with the study by Arora et al.<sup>17</sup> where 78.6% of respondents felt the same. According to studies performed by Ahmed et al.<sup>18</sup> and Sezgin et al.<sup>16</sup>, nearly 85% of respondents claimed that the surgical mask does not have enough protection. Majority of the participant's (90%) source of information was media like television, radio, newspaper, etc. But these platforms are not always reliable as fake news or wrong information is being spread without any proper evidence. It is in contrast to study done by Nasser et al.<sup>19</sup> in which 73.37% of dentists used official government websites such as the World Health Organization as the main source of information about COVID-19.

Majority (60.6%) of the participants perceived COVID-19 as very dangerous and considered it as a serious health issue. As increased disease severity and mortality is seen in patients with more than 55 years of age and/or with multiple pre-existing comorbidities which are at higher risk. This would indicate majority of the Indian population is at risk of getting COVID-19 infection.

Over half of the participants said they would prefer to avoid working with a patient with a suspected case of COVID-19 because of the possibility of disease transmission during incubation periods, during which no symptoms may appear.<sup>13</sup> In a study by Arora et al.<sup>17</sup> also showed similar results. It is in contrast to the study by Khader et al.<sup>2</sup> and Sezgin et al.<sup>16</sup> in which majority of the dentists preferred to avoid treating a suspected COVID-19 patient. When sector wise comparing was done, dentist of public sector reported least confidence in handling such suspected patients. This can be due to shortcomings like patient overflow, negligible management and infection control protocol. In India, Aarogyasetu App helped track alleged COVID-19 patients due to continuous awareness across the media channel. This was also reflected in the study as almost all participants were aware about whom to contact and what to do where there has been an unprotected exposure or having sign and symptoms of COVID-19 infection. Similarly, in study by Arora et al.<sup>17</sup> about 80–90% of the respondents reported the same. This finding was in contrast to the study conducted by Khader et al.,<sup>2</sup> which revealed that only half of the dentists (58.2%) were aware of whom to contact in such a situation.

A number of dentists (42.9%) would allow their dental staff to work with patients if they had flu-like symptoms. This is an alarming fact for overall well being of society. During such outbreak like COVID-19, dentists should follow a proper protocol and check temperature of every staff and patient as a routine procedure to evaluate risk of transmission. Detailed health status and any history of recent contact or travel of the patients should be asked,<sup>14</sup> and providing patients with medical masks upon entry to the clinic.<sup>2</sup>

The some of the limitations of this survey would be, smaller than expected sample size. The brief time of data collection may have created this situation. Different in zonal participation among the dentist could result in selection bias and sampling error, which prevents the ability to generalize our results.

## **V. Conclusion**

Within the limitation of the study, it can be said that the dental practitioner knew about the symptoms of COVID-19 and its mode of transmission. They also had a fair idea about the precautionary measures, but their knowledge regarding the infection control for the dental staff and patients was very limited. Thorough guidelines should be provided by the dental association and infection control board to all the dental practitioners regarding any such pandemics. Right from the academic level for graduate and postgraduate students programs pertaining to regarding infection control and disease outbreak should be included. This would encourage better and safe practice and disease management.

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