



# Covid-19 Knowledge and Perceptions Among Dental Specialists: A Cross-Sectional Online Questionnaire Survey

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**Background:** The recent outbreak of coronavirus (COVID-19) caused a significant impact on dentistry. It is imperative to have sufficient knowledge of COVID-19 to manage patients in the dental operator.

**Aim:** To assess the knowledge and perceptions of dentists from different specialities about COVID-19 disease.

**Settings and Design:** Cross-sectional online survey.

**Materials and Methods:** This study used a descriptive cross-sectional study design with a self-administered questionnaire. The questionnaire included three sets of 23 questions [Demographic-4; Source of information-1; Knowledge-10 and Perceptions-8]. The comparison of mean scores of knowledge and perceptions were interpreted based on the occupation of dental specialists.

**Statistical Analysis Used:** The association between demographic variables and dental specialists' knowledge and perception scores was carried out using SPSS (Version IBM 21.0, NY, USA).

**Results:** A total of 429 dentists from various specialties participated in the present study. The study had obtained a overall good knowledge score (92.7%) with a mean value of 8.86 + 0.22, and a perception score (70.7%) with a mean value of 5.4+0.3. The present study reports a statistically significant difference between age ( $p=0.03$ ) and knowledge source ( $p<0.05$ ). The multi variate regression analysis showed that dentists' specialty had no significant effect on knowledge and perception.

**Conclusion:** The study reports sufficient knowledge and perception scores. Oral maxillofacial surgeons showed higher knowledge scores, while prosthodontics and periodontics achieved good mean scores for perception on COVID-19. Social media and health authorities played an equally important role in the overall knowledge of the source of information related to COVID-19.

**Keywords:** COVID-19, dentists, infection, questionnaire, dentistry

## Introduction

The healthcare profession significantly impacted the current COVID-19 pandemic outbreak due to the transmission of the COVID-19 virus from positive patients. The COVID-19 virus is predominantly known to affect the respiratory system of the infected person. The incubation period is from 1–14 days, and mainly 3–7 days is the most infectious period.<sup>1</sup> There is a significant threat to the dental profession as most dental treatments are aerosol-generating procedures (AGPs), and droplet spread is the

predominant mode of transmission of the COVID-19 virus. Hence, the medical professions, especially dentists, are at high risk of transmission of this disease. There are higher chances of contamination of the dental operator with infectious viral load from saliva, blood, and aerosols.<sup>2</sup> The dental operator and waiting room should have adequate ventilation. The coronavirus is reported to be viable in the air for 3hrs while 5.6hrs on stainless steel and 6.8hrs on plastic surfaces.<sup>3</sup> Dentists are recommended to consider every patient as COVID-19 positive and expected to limit the treatments to emergency procedures. After completing the dental treatments, it is imperative to disinfect dental operator to avoid transmitting infectious diseases adequately.<sup>4</sup>

Various health authorities such as the Centers for Disease Control and Prevention (CDC), American Dental Association (ADA), and the World Health Organization (WHO) have proposed guidelines for infection control and the safety of dentists and healthcare personnel. Developing protocols for infection control and usage of personal protection equipment (PPE) have been the primary focus. Dentists' can use various strategies such as rubber dam isolation, anti-retraction devices, and pre-procedure antimicrobial mouth rinse to reduce viral load in saliva for maximum safety and protection of dental staff and patients. Dentists' are expected to be familiar with the COVID-19 disease and the guidelines for treating patients in the operatory.<sup>5,6</sup> A well-designed questionnaire is an excellent tool to understand dentists' knowledge and perceptions.<sup>7-10</sup> The present study aimed to assess dentists' knowledge and perceptions (faculty and private practitioners) from different specialties about the COVID-19 disease, mode of transmission, infection control measures, and their significant fears and concerns.

## Materials and Methods

The study was conducted in full accordance with the World Medical Association Declaration of Helsinki and approved by the Ethics Committee of Majmaah University, Majmaah, Saudi Arabia (MUREC.July.22/ COM-2020/36-2). The present study used a descriptive-analytical survey of the cross-sectional design. The participating dentists' were informed about the purpose of the study and how to answer the questionnaire. The present study was designed to assess the current pandemic COVID-19 among the dental specialists' knowledge and perceptions. The present study used a questionnaire consisting of various questions and multiple choices. A pilot study was carried out to validate the content and reliability of the questionnaire. It

was a collaborative study (College of Dentistry, Majmaah University, KSA and Narayana Dental College and Hospital, Nellore, India), and data analysis was carried out across the dental specialties. Two investigators (MSK from KSA and SS from NDCH) have been involved in developing the questionnaire and in data collection. A convenience and snowball sampling technique was used for the study. The questionnaire was administered via an electronic Google form and was sent online (Whatsapp and email) from 15.07.2020 to 31.08.2020. The questionnaire ([Appendix 1](#)) included three sets of 23 questions [Demographic-4; Source of information-1; Knowledge-10 and Perceptions-8]. A welcome message was sent along with detailed study information to the participant to request to provide their consent. Participation in the study is voluntary and all the participants were asked to review participant information on welcome message and mark consent prior to participation in the survey to confirm their agreement to participate in this research study. Upon all participating dentists explicit willful consent and were recruited from faculty, and private practitioners belong to various specialties from India involved in the study. Undergraduates, postgraduates, general dentists, other allied health care professionals, dental specialists from other than India were excluded from the study. The study eliminated the questionnaires which had unanswered questions. All the participants were divided into groups based on the specialty [oral maxillofacial surgery, oral medicine, oral pathology, public health, conservative and endodontics, orthodontics, prosthodontics, periodontics, and pedodontics]. Each response was scored as "1" (positive) and "0" (negative), with scores ranging from 1 to 10 for knowledge and 1 to 8 for perceptions. The participants' perceptions were classified as good (>median) or poor (score ≤median). Three options were considered to collect data related to the source of information on COVID-19 disease (1.Social media include WhatsApp, YouTube, Telegram, Facebook, Twitter, Snapchat, etc.; 2. Health authorities include WHO, CDC, ADA, university authorities, local and international societies; and 3. Both).

## Statistical Analysis

The present study compared the data based on the occupation of dental specialists. Analysis of the data was performed using descriptive and chi-square statistics. The association between demographic variables and the dental specialists' knowledge scores was performed using multivariate linear regression analysis. A Chi-square test was

used to know the association between study variables and perception questions. One-way ANOVA for multi-comparisons and Bonferroni coefficient tests to evaluate the correlation between knowledge and perceptions. The scores were expressed as mean value  $\pm$  standard deviation. All the statistical analysis was performed using IBM Corp. (Released in 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.) with a 95% confidence level where  $p < 0.05$ .

## Results

Responses from 459 dentists from various specialties were available in the present study. Three hundred and ninety-six (194 males and 202 females) from various specialties were available for the analysis in the present study; an almost equal number of private practitioners (199) and faculty working in the university (197) have participated in the survey (Table 1). The present study questionnaires were completed from specialties, including oral maxillofacial surgery, oral medicine, oral pathology, public health, conservative dentistry and endodontics, orthodontics, prosthodontics, and periodontics, and pedodontics utilised for statistical analysis. Four hundred fifty-nine dental specialists participated in the survey, and 63 participants excluded from the final analysis. Among these 63 participants, 33 did not mention the specialty and significantly less participation from oral medicine (11), oral pathology (4), and public health dentistry (15).

The present study obtained an excellent overall knowledge score of 92.7%, with a mean of  $9.26 \pm 1.82$ . Overall, 99.56% of participants from all dental specialties believed that coronavirus is a viral infection. A total of 80.71% of dental specialists believe that coronavirus is fatal; out of which 92.7% of oral surgeons and 74.2% of prosthodontists thought that it is fatal. The majority of specialist dentists had good knowledge (98.3%, 98.9%, 93.1%, 98.7%, and 97.3%) for questions related to the mode of transmission by close contact with infected persons, the signs and symptoms of COVID-19 infection, incubation period around two weeks, the risk of COVID-19 for dentists and the impact of medical history (chronic diseases) as a risk factor in acquiring COVID-19 respectively (Table 2). A total of 90.6% of dentists believe that vaccine is not available in the market yet; only 83.9% of oral surgeons believe that COVID-19 can be prevented by hand sanitation, with the overall score being 91.58%. Among the knowledge questions, using an N95 mask during COVID-19 pandemic achieved the least overall

score (78.7%). The mean scores achieved by each specialty were  $9.04 \pm 1.43$ ,  $9.47 \pm 0.87$ ,  $9.35 \pm 0.96$ ,  $9.19 \pm 1.2$ ,  $9.32 \pm 0.8$ , and  $9.2 \pm 0.8$  for conservative dentistry and endodontics, oral maxillofacial surgery, orthodontics, prosthodontics, periodontics, and pedodontics, respectively (Table 2). There was a vast disparity evident in high and low knowledge scores among dental specialists (Table 3). The present study reports a statistically significant difference between age ( $p = 0.03$ ) and knowledge source ( $p = 0.00$ ) (Table 4). Simultaneously, multivariate regression analysis showed that dentists' specialty had no significant effect on knowledge and perception.

The overall perception score was 70.7%, with a mean value of  $5.4 \pm 0.3$ . About 66.53% of individuals are worried that one of their family members may get the COVID-19 virus, out of which highest were periodontists (74.2%). Good scores were obtained for question-related preventive measures using standard and isolation precautions given by health authorities (92.13%), and dentists must avail themselves of all information about the COVID-19 (96.06%). The majority of dentists (82.11%) believe that the prevalence of COVID-19 can be reduced by the active participation of health care workers in the hospital infection control program, with the least being oral surgeons (76.4%). The least score was obtained (77.35%) for interest in the intake of the COVID-19 vaccine when available, with the least being endodontists (72.6%). A total of 77.88% of dentists believe that dental treatment should be provided to patients with COVID-19 positive, out of which 83% were orthodontists, and 70.6% were pedodontists (Table 5).

A significantly low score was obtained (39.83%) for questions about the availability of information about COVID-19 in your professional society sufficient. Out of these, 51.6% were prosthodontists, and the least score being among periodontists (30.6%). Out of all the perception questions, the least score (34.76%) was obtained for the government institutions that can control the pandemic, which shows the concern among dentists about the government's available resources to manage the COVID-19 pandemic (Table 5). The source of information for the majority of dentists was the single source (69.4%), and social media (34.1%) and health authorities (38.9%) played an equally important role in the overall knowledge and perceptions of dentists, around 27% of dentists relied on both the sources for information related to COVID-19 (Figure 1).

**Table 1** Socio-Demographic Characteristics of the Dental Specialists Who Participated in the Study

Characteristics	Conservative dentistry and Endodontics	Oral maxillo-facial surgery	Periodontics	Prosthodontics	Pedodontics	Orthodontics	Total
<b>Gender</b>							
Male	32	32	28	34	44	24	194
Female	30	23	34	28	58	29	202
Total	62	55	62	62	102	53	396
<b>Age (Years)</b>							
≤30	23	23	29	26	47	28	176
31–35	22	16	19	19	29	12	117
36–40	7	7	5	11	6	2	38
41–45	5	5	1	3	9	7	31
46–50	1	1	5	1	7	4	19
More than 50	4	3	3	1	4	0	15
Total	62	55	62	62	102	53	396

The overall mean knowledge score was  $9.26 \pm 1.82$ , and among the dental specialists, oral maxillofacial surgeons achieved the highest mean scores ( $9.5 \pm 0.87$ ). In contrast, specialists who belong to conservative dentistry and endodontics achieved lower mean scores ( $9.04 \pm 1.43$ ), as summarised in Table 3. Prosthodontists ( $5.85 \pm 1.34$ ) and periodontists ( $5.85 \pm 1.26$ ) achieved a higher mean score, and oral maxillofacial surgeons achieved a lesser score ( $5.4 \pm 1.69$ ) with overall mean scores of  $5.4 \pm 0.39$  in case perceptions on COVID-19 (Table 3). Both knowledge and perceptions mean scores showed no statistical significance among the specialties.

The overall mean knowledge scores showed statistical significance with age and source of information ( $P < 0.05$ ), while the dental specialty does not offer any significance ( $P > 0.05$ ). Perception mean scores were not influenced by age, department, and source of information ( $P > 0.05$ ), as summarised in Table 4. The dental specialists who participated in the study showed high median scores for both knowledge (8) and perceptions (6) of the COVID-19 disease, respectively (Table 5). Participants achieved minimum knowledge scores in specialties of pedodontics (2), conservative dentistry, and endodontics (3), while the maximum score 10 for all the other departments. Participants achieved the minimum perception scores in

the specialties of conservative dentistry and endodontics (0), pedodontists (0), and oral maxillofacial surgeons (0), while maximum score 8 for all the other departments (Table 3). The mean and median values of overall scores based on the departments were summarised in Table 6. Almost all the specialists achieved the same mean median regarding knowledge and perceptions irrespective of the specialty (Table 6).

## Discussion

The present study was carried out among the dental specialist from various dental specialties when the COVID-19 pandemic was reaching its highest peak among different specialties of dentistry and is one of the studies with a sample size of 396 dentists. This study investigates dental specialists' knowledge, and perceptions about COVID-19 and evaluates their primary information source. A total of 202 females and 194 males participated in this study from different dental specialties. Earlier studies from Italy (349)<sup>11</sup> and Jordan (368)<sup>12</sup> reported with almost equal participants. The present study obtained an overall knowledge score of 92.7%, with a mean of  $8.86 \pm 0.22$ . In contrast, Gambhir and co-workers,<sup>13</sup> in a survey performed among Indian dentists, have reported a high knowledge score in only 65 dentists (30.2%), and around

**Table 2** Knowledge Scores on COVID-19 Among Dental Specialists

Knowledge	Conservative Dentistry and Endodontics	Oral Maxillo-Facial Surgery	Periodontics	Prosthodontics	Pedodontics	Orthodontics	Overall Scores
Do you know that COVID-19 is a viral infection?	98%	100%	100%	100%	99%	100%	100%
Do you know that COVID-19 is fatal?	81%	93%	81%	74%	75%	82%	81%
Do you know that COVID-19 is transmitted by close contact with an infected person?	95%	98%	100%	98%	98%	100%	98%
Do you know that fever, cough, and shortness of breath are symptoms of COVID-19?	98%	98%	100%	100%	99%	98%	99%
Do you know that the incubation period is COVID-19 is 2 weeks?	90%	91%	94%	92%	96%	96%	93%
Do you think the vaccine is available in markets?	94%	91%	87%	90%	93%	89%	91%
Do you think washing hands with soap and water or sanitizer can help prevent COVID-19 transmission?	84%	91%	95%	97%	90%	93%	92%
Do you know dentists are at a higher risk of COVID-19?	97%	100%	98%	100%	99%	98%	99%
Do you think patients with underlying chronic diseases are at a higher risk of COVID-19?	97%	95%	100%	98%	96%	98%	97%
Do you know that the use of N-95 can help in avoiding COVID-19?	71%	91%	77%	76%	75%	83%	79%

82 dentists reported a lesser knowledge mean score of  $6.56 \pm 2.54$ . In the present study, a knowledge score of 62.1% was achieved related to COVID-19, with the periodontist (54.8%) being the least. The low score might be due to the lack of established guidelines from health authorities and concern among the dentists due to ever-increasing mortality rates during this pandemic outbreak. Only 78.7% of dentists believe that usage of the N95 mask can prevent the transmission of COVID-19, out of which oral surgeons ranked the least (71%). A low score achieved in the present study may be due to the relative unavailability of the

N95 mask for usage and comparatively higher cost. Cagetti and co-workers<sup>14</sup> from Italy reported a similar score of 74.5% with a surgical mask with a sample size of 3599. Ahmed and co-workers<sup>15</sup> reported a study that included dentists from 30 countries and reported a significantly low score (9%) to use the N-95 mask among general and specialty practitioners.

Similarly, significantly low scores (12.36% and 18.4%) were reported by two other studies by Duruk and co-workers<sup>16</sup> and Putrino and co-workers.<sup>17</sup> Around 90.6% of dentists believe that vaccine is not available yet in the

**Table 3** Comparison Between Knowledge and Perception Scores (Average Mean Values) Achieved by Various Dental Specialists Using One Way- ANOVA

Details	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	P-value
					Lower Bound	Upper Bound			
<b>Knowledge</b>	Conservative dentistry and Endodontics	9.04	1.43	0.18	8.68	9.41	3.00	10.00	P>0.05
	Oral maxillo-facial surgery	9.47	0.87	0.11	9.23	9.71	6.00	10.00	
	Orthodontics	9.36	0.96	0.13	9.09	9.62	5.00	10.00	
	Pedodontics	9.2	1.21	0.12	8.95	9.43	2.00	10.00	
	Periodontics	9.32	0.88	0.11	9.09	9.54	7.00	10.00	
	Prosthodontics	9.26	0.84	0.10	9.04	9.47	7.00	10.00	
	Total	396	9.26	1.08	0.05	9.15	9.36	2.00	
<b>Perceptions</b>	Conservative dentistry and Endodontics	5.58	1.96	0.24	5.08	6.07	0.00	8.00	P>0.05
	Oral maxillo-facial surgery	5.40	1.69	0.22	4.94	5.85	0.00	8.00	
	Orthodontics	5.77	1.29	0.17	5.41	6.13	2.00	8.00	
	Pedodontics	5.53	1.62	0.16	5.22	5.85	0.00	8.00	
	Periodontics	5.85	1.26	0.16	5.53	6.17	3.00	8.00	
	Prosthodontics	5.85	1.34	0.17	5.51	6.19	2.00	8.00	
	Total	396	5.65	1.56	0.08	5.50	5.81	0.00	

market. Contrarily, Gambhir and co-workers<sup>13</sup> reported that 42% of subjects had adequate knowledge regarding vaccines to prevent COVID-19. Zhong and co-workers<sup>18</sup> stated that 94% of dentists have sufficient knowledge about vaccine availability in a study of sample size 6919 dentists in China, while Kamate and co-workers<sup>19</sup> described a score of 68.1% regarding knowledge on a vaccine from their multi-national study. In this study, dentists had adequate knowledge that repeated handwashing with soap and sanitizers (91.5%) can help prevent infection transmission and these findings were in agreement with prior studies.<sup>10–12,16</sup>

The present study obtained an overall perception score of 70.7% with a mean value of 5.4 ± 0.3. Only 77.3% of dental specialists believed that vaccine would prevent COVID-19 disease; among them, endodontists scored the least (72.6%). The uncertainty might be due to the unavailability of the vaccine in the market. Around 92.13% believed that usage of standard guidelines recommended by health authorities could significantly reduce transmission risk. Khader and co-workers<sup>12</sup> found that 92.9% of dentists in Jordan were willing to wear personal protective equipment such as masks, gloves, and goggles recommended by health authorities. The fear of transmission of the COVID-19 was observed in 66.5% of dentists who participated in the present study. Five prior surveys by Cagetti and co-workers<sup>14</sup> (80.3%), Kinnariwala and co-workers<sup>20</sup> (97%), Ahmed and co-workers (92%), Martina and co-workers<sup>15</sup> (88%), and Putrino and co-workers<sup>19</sup> (87.5%) significantly higher scores. However, the present study was conducted among dentists' from various specialities. According to Duruk and co-workers,<sup>16</sup> over 95% of Turkey's dentists were more concerned that their families might get infected as dentists are more prone to carry the infection from the aerosols in the dental operator. Compared to other studies, the present study's low score might be due to the availability of standard guidelines to prevent transmission of the COVID-19 infection, and dentists have adequate knowledge to limit disease transmission. Around 82.11% of dentists agree that participation as a health care worker in a hospital infection control program can reduce the transmission of the COVID-19 virus. Questions related to the availability of information in the professional society (39.8%) and government institutions' potentiality to handle this pandemic (34.7%) obtained significantly lesser scores. The results show the governments' necessity to act successfully to limit infection transmission and provide financial aid for organizations facing a crisis

**Table 4** Association Between Demographic Variables and the Dental Specialist's Knowledge and Perception Scores Using the Multivariate Linear Regression Analysis

Details		Unstandardized Coefficients		Standardized Coefficients	t	P-value	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
Knowledge	(Constant)	8.87	0.23		38.76	0.00	8.42	9.32
	Age (Years)	-0.04	0.02	-0.10	-2.11	0.03	-0.08	-0.01
	Department	0.01	0.03	0.02	0.46	0.65	-0.05	0.08
	Source	0.41	0.12	0.18	3.57	0.00	0.19	0.64
a. Dependent Variable: knowledge score								
Perceptions	(Constant)	5.45	0.37		16.22	0.00	4.79	6.11
	Age (Years)	-0.03	0.03	-0.05	-0.99	0.32	-0.09	0.03
	Department	0.07	0.05	0.07	1.39	0.16	-0.03	0.16
	Source	0.08	0.17	0.05	0.49	0.62	-0.25	0.42
a. Dependent Variable: perceptions score								

during this time.<sup>21</sup> The source of information for 69.4% of dentists was from a single source, and the rest 30% is from multiple sources. The knowledge score was observed to be dependent on the source of information. It was evident that the information on COVID-19 from the social media and health authorities successfully provided adequate knowledge to dentists in the present study.

A Pakistani study found a low mean knowledge score of  $4.19 \pm 1.88/12$  and a positive attitude score of  $12.24 \pm 3.23/15$  on COVID-19 among dentists.<sup>22</sup> The present study, the overall mean knowledge, and perception scores were  $9.26 \pm 1.82/10$  and  $5.4 \pm 0.3/9$ , respectively. Pakistani study was clearly stated that the specialist of the dentists participated in their study.<sup>22</sup> Putrino and co-workers<sup>18</sup> conducted a study in Italy with general dentists (42%) and specialist dentists (58%), and authors have not revealed the knowledge and awareness scores for the individual specialty. The present study was performed among various dental specialists; hence the results were not comparable. The overall knowledge mean scores on COVID-19 showed statistical significance with age and source of information ( $P < 0.05$ ), while the dental specialty does not offer any statistical significance ( $P > 0.05$ ). Perception mean scores were not influenced by age, the department, and information source ( $P > 0.05$ ). The median for knowledge and perceptions were 8 and 6, respectively. The dental specialists who participated in the study showed high median scores for both knowledge and perceptions of the COVID-19 disease. None of the studies published in the literature reported the influence of age factors, the source of information, and

dental specialty on the knowledge and perceptions of COVID-19.<sup>11-18</sup> The majority of the dental specialists achieved a maximum score for knowledge (10) and perceptions (8) in the present study. The good scores obtained are due to adequate information from social media and health authorities focused on the COVID-19 globally. The authors opine that the health authorities around the successfully dealt with the pandemic outbreak of COVID-19. Overall, the study results demonstrate that dentists have an adequate basic understanding of COVID-19 disease transmission, fatality, and methods to prevent the same. However, there is a need for established guidelines from health authorities and more successful government strategies to ensure the dentists that the disease would be under control.<sup>23-28</sup> Furthermore, a recent study from the United States stated that a new level of protective measures are required in the dental operator, and updated operational guidance and policies are obligatory among oral health care professionals.<sup>27</sup> A Italian study<sup>29</sup> reported similar scores of knowledge (87%) regarding COVID-19 and lower scores regarding perceptions (56%) COVID-19. This study was conducted among the dental students hence the present study findings were not comparable. A few studies<sup>30-34</sup> from various countries had have been reported on knowledge and perceptions regarding COVID-19 among dentists. No study was performed among the dental specialists. An Italian group<sup>35</sup> of authors suggested that the COVID-19 might change the training approach in dentistry in coming years by necessity an innovative suggestion to avoid infection risk. A piece of holistic information about any

**Table 5** Perception Scores COVID-19 Among Dental Specialists

Perceptions	Conservative Dentistry and Endodontics	Oral Maxillo-Facial Surgery	Orthodontics	Pedodontics	Periodontics	Prosthodontics	Overall Scores
Are you worried one of your family members may get COVID-19?	65%	58%	68%	67%	74%	68%	67%
Transmission of COVID-19 can be prevented using standard and isolation precautions given by WHO, CDC, ADA, etc?	90%	89%	96%	90%	94%	94%	92%
The prevalence of COVID-19 can be reduced by the active participation of health care workers in the hospital infection control program?	84%	76%	81%	80%	92%	79%	82%
If a COVID-19 vaccine is available, would you have it?	73%	75%	79%	77%	86%	76%	78%
Do you think dental treatment should be provided to patients with COVID-19 positive?	74%	78%	83%	71%	79%	82%	78%
Dentists must avail themselves of all information about the COVID-19?	95%	93%	96%	97%	98%	97%	96%
Is the available information about COVID-19 in your professional society sufficient?	39%	38%	38%	42%	31%	52%	40%
Are the government institutions able to control the pandemic?	39%	33%	36%	30%	32%	39%	35%

communicable disease is essential to prevent and control this transmission, especially susceptible. The authors<sup>35</sup> also suggested blended learning in dental education. A recent multi-national study<sup>36</sup> involving 2045 dental academicians from 26 countries found lower knowledge scores regarding the symptoms of COVID-19 than the diagnostic methods used for COVID-19. These findings are not compared to the present study because the present study objectives are knowledge and perception regarding COVID-19. The dentists from nine specialities have participated in the study, and among the study sample, the departments (oral

pathology, oral medicine, and community dentistry) were excluded from the final analysis due to significantly less sample size. The study was performed in the Indian sub-continent, and all the participants participated from India. The study's limitations are a small sample size, and the research was conducted during the early stage of the COVID-19 pandemic outbreak. Only 429 participants from different specialities were participated in the present study, and the questionnaire was sent through social media; hence, the response rate was not sought. It is also considered a potential limitation. To the best of our knowledge, no



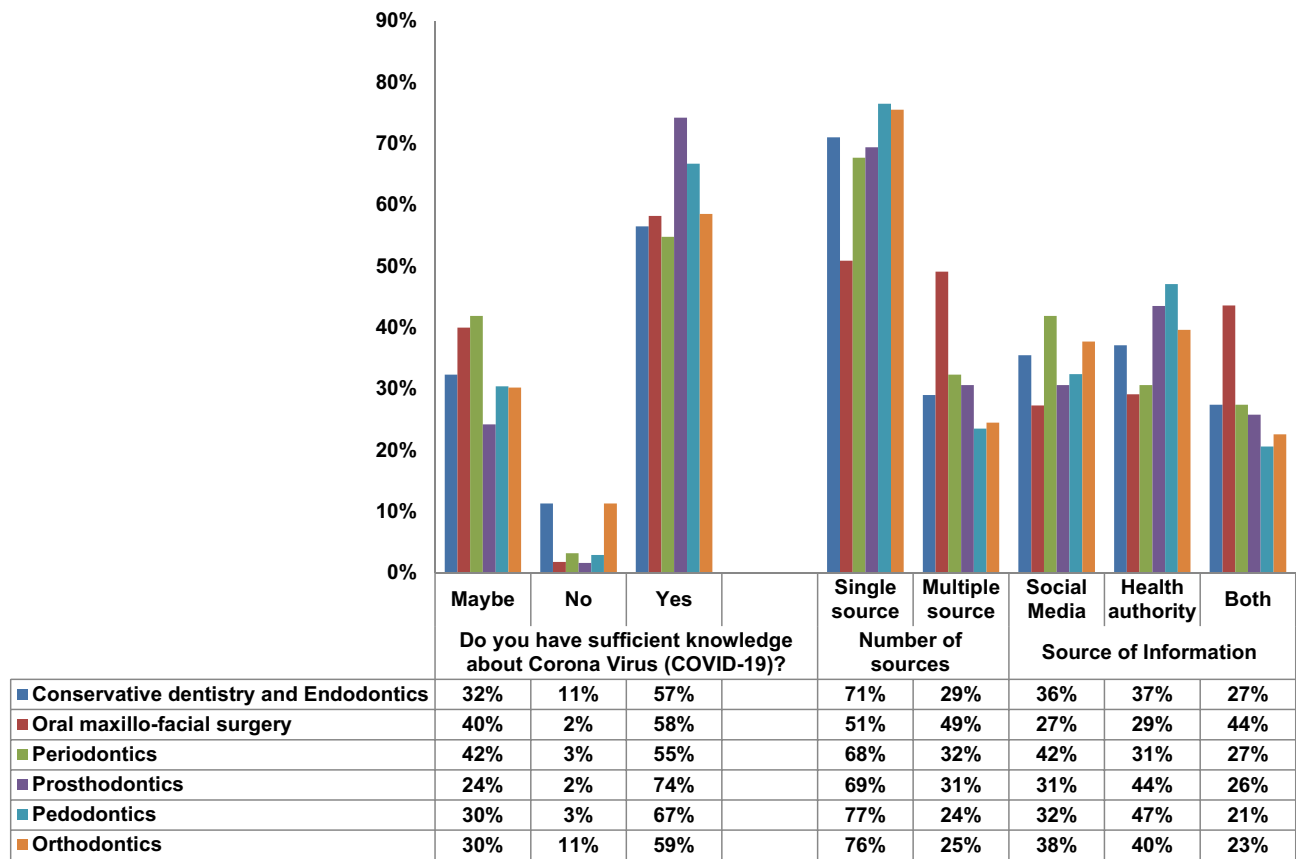


Figure 1 The details of the source of information utilized by dental specialists who participated in the study.

literature exists on the dental specialists' knowledge and perception scores on COVID-19. Despite these limitations, this study's findings may contribute to the existing literature

by exploring the determinants of knowledge and perception regarding COVID-19 among dental specialists belonging to various specialities. Nonetheless, the study was the first of

Table 6 Knowledge and Perception Scores of the Participants Regarding Coronavirus Disease 2019

Details	Details	Conservative Dentistry and Endodontics	Oral Maxillo-Facial Surgery	Periodontics	Prosthodontics	Pedodontics	Orthodontics
<b>Knowledge</b>	Range of scores achieved (maximum)	10	10	10	10	10	10
	Minimum	3	6	7	7	2	5
	Mean	9.5	9.47	9.3	9.26	9.2	9.3
	Median (cut-off point) 8	9.5	10	10	9	10	10
	Good knowledge scores n (%)	77	87	85	84	82	87
	Poor knowledge scores n (%)	23	13	15	16	18	13
<b>Perceptions</b>	Range of scores achieved (maximum 8)	8	8	8	8	8	8
	Minimum	0	0	3	2	0	2
	Mean ±SD	5.58	5.4	5.8	5.8	5.5	5.7
	Median (cut-off point) 8	6	6	6	6	6	6
	Good knowledge scores n (%)	44	49	39	42	45	38
	Poor knowledge scores n (%)	56	51	61	58	55	62

its kind to study knowledge and perceptions (attitude and awareness) among dental specialists.

The dental specialists' showed adequate knowledge of disease and preventive measures. There seems to be a gap in understanding the precautionary measures such as usage of N95 masks and vaccines, availability of information in a professional society, and regular updates from the government in successful control of the pandemic. Health authorities succeeded in promoting the COVID-19 and precautions to avoid the spread of the viral disease. Currently, COVID-19 disease is reaching a peak in various territories around the globe. The gap should be filled to make sure the dentist, auxiliaries, and their families are at low risk of transmitting the COVID-19 disease.

## Conclusion

The present study reported an overall sufficient knowledge and perception scores, and dentists had an adequate understanding of COVID-19 disease and preventive measures. Oral maxillofacial surgeons showed higher knowledge scores among all the specialities, while prosthodontists and periodontists achieved good perception scores. The majority of dentists have used a single source for information (69.4%), and social media (34.1%) and health authorities (38.9%) played an equally important role in the overall knowledge related to COVID-19.

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## Author Contributions

All authors made significant contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in preparing the manuscript or revision or proofreading it critically for important intellectual content; approved to submit to the Risk Management and Healthcare Policy; All the authors have given final approval of the version to be published; and agreed to be responsible for all aspects of the work.

## Disclosure

All the authors declared no conflicts of interest.

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