

Change in Knowledge, Awareness, and Perception of Dentists Regarding COVID-19 in Belagavi City, Karnataka: A Questionnaire Study

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ABSTRACT

Aim: The study aims to assess the change in knowledge, awareness, and perception about COVID-19 among the dentists in Belagavi city, Karnataka.

Materials and methods: A cross-sectional study was conducted among 212 dentists in Belagavi city, Karnataka. A self-designed questionnaire consisting of eight close-ended and five open-ended questions was used for the data collection in two phases, once in June 2020 and once in December 2020. All the data relating to demographic details followed by knowledge, awareness, and perception of dentists regarding COVID-19 were recorded. Descriptive statistics, Chi-square test, and McNemar test were used.

Results: A total of 212 dentists participated in both phases of the study in June 2020 and December 2020. Most of them (39.6%) belonged to the age-group of 35–45 years, and 41.5% had more than 5 years of working experience in a private clinic. In phase 1 of the assessment of June 2020, almost 86.3% of the dentists agreed that dentists should use personal protective equipment kits for treatment, but only 35.8% knew what was included. There was a change in the knowledge, awareness, and perception in the second phase in December 2020 which was statistically significant.

Conclusion: The knowledge, awareness, and perception of the dentists regarding COVID-19 in Belagavi city in December 2020 have increased when compared to June 2020. The ready availability of information and easy acquirement of knowledge, leading to better adaptability were the major reasons behind it.

Clinical significance: The knowledge, awareness, and perception type of assessment regarding COVID-19 among the dentists in Belagavi city is important to analyze and evaluate their readiness to restart dental practices and how prepared they are in doing so.

Keywords: Awareness, COVID-19, Dentists, Knowledge, Perception, Questionnaire.

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INTRODUCTION

The World Health Organization (WHO) declared COVID-19 as a public health emergency of international concern on 30th January 2020, and it took only 6 months for it to become a global pandemic, affecting close to 200 countries.¹ It is caused by a zoonotic pathogen called SARS-CoV-2, which can be transferred from one animal to another.² It is basically a single-stranded RNA virus with spike proteins, a capsid, and an envelope membrane.³ The main features of the virus that set it apart from the others in the coronaviridae family is its excessively high transmission potential and low pathogenicity.⁴ It transmits from human to human either through droplets or by direct contact with contaminated surfaces.⁵ According to the Centers for Disease Control and Prevention (CDC), the main symptoms of this infection are cough, fever with chills, headache, sore throat, body ache, transient loss of smell and taste, congestion, or runny nose, which can progress to breathing difficulties and respiratory distress sometimes.⁶

Initially, the virus seemed to be severe for the elderly and immunocompromised individuals. However, continuous mutation of the virus has enabled it to affect almost all age-groups equally. The worst part about COVID-19 is that its symptoms and prognosis are continuously changing. While some people remain in an asymptomatic phase for the entire period of incubation and infection and recover on their own, there are evidence of cases getting exaggerated overnight and patients succumbing to it. The condition in India worsened in a short period, with millions of people

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being actively infected and a substantial number of them dying while some had long-lasting negative impacts.⁷ In order to prevent the further spread of the virus, a lot of importance was given to taking precautions like wearing a suitable mask, maintaining proper hand sanitization, and social distancing and it continues to be the same. Initially, the government had to take the extreme measure of announcing a countrywide lockdown multiple times as well.

Different types of healthcare workers, including dentists, were deemed the most vulnerable groups as they had the maximum probability of contracting and spreading the disease.⁸ Many aerosols and splatter are produced while performing routine dental procedures, which can increase the chance of

cross-contamination.⁹ Initially, the data related to the role of aerosol in the diffusion of the pathogen was not well-established.¹⁰ However, recent studies have proven that the aerosols produced during dental treatment can remain suspended in the air for hours and contain the viable virus in it as well.¹¹ Due to this reason, it was recommended by the health officials to stop or limit dental practice to as minimum as possible, treating only the emergency cases.¹²

As the ongoing pandemic moved through various phases of lockdown and unlock in India, it was imperative to understand how much knowledge and awareness the dentists themselves had about COVID-19 and what was their perception about it in order to judge if they were adequately prepared to deal with it. A knowledge-attitude-perception (KAP) type of questionnaire study done on dentists was best suited for it and was employed here. The study was conducted in two different time periods, once when all the dental clinics were closed down due to the lockdown imposed in Belagavi city in the month of June 2020, and again in December 2020 when dental clinics had started to reopen. The study aimed to assess the change in knowledge, perception, and awareness among the dentists regarding COVID-19 in Belagavi city, Karnataka at these two different time periods.

MATERIALS AND METHODS

Study Design and Sample Size

The descriptive, cross-sectional, questionnaire type of study was conducted on the dentists in Belagavi city who were members of the Indian Dental Association, Belagavi, and had a private practice in Belagavi city. The study was conducted in two phases, once in June 2020 and another time in December 2020. For the representative sample, the list of all dentists registered under the local Indian Dental Association based in Belagavi was obtained through email. According to the listing, the total number of dentists in Belagavi city was 366 and 256 had their own private practice. All the dentists were approached for a response to the study. The dentists who were not willing to participate in the study were excluded.

Measuring Instrument

Ethical clearance was obtained from the Institutional Ethics Committee. Written informed consent was obtained from the participants after explaining the purpose of the study, before starting it. The study was conducted using a questionnaire prepared in the English language validated by two experts in the field. It was assessed for simplicity, clarity, relevance, and ambiguity.

CVI score of each component of the questionnaire came above 0.60, which was deemed to be satisfactory. A pilot study was conducted among 20 dentists to check for internal consistency, test-retest reliability, and inter-rater reliability. The initial part of the questionnaire contained sociodemographic details of the participants, which included their name, age, sex, educational qualification, and the number of years of work experience as a private practitioner. Additionally, the questionnaire contained eight closed-ended questions and five open-ended ones, out of which three were knowledge-based while two were on perception, and seven were awareness-based.

Data Collection

For the first phase held in June 2020, a telephonic interview method was employed to collect the responses from the dentists. A trained primary investigator made all the calls so that there was no discrepancy in recording the data. For phase 2, held in

December 2020, the same dentists were again contacted, and a telephonic interview was conducted, while some were approached through a visit to the clinics personally. In June 2020, 223 dentists responded to the study. However, 212 of them could be contacted in December 2020, and they were the final inclusions for data analysis and synthesis of results.

Statistical Analysis

After the data was collected, it was entered into an appropriate Excel sheet and analyzed using the software SPSS Version 21.0 (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0, Armonk, NY, USA: IBM Corp.). Descriptive statistics and the Chi-square test were employed. McNemar test was also applied to check whether the change in knowledge, attitude, and perception of dentists from June 2020 to December 2020 was statistically significant or not. The *p*-value of less than 0.05 was taken to be statistically significant.

RESULTS

A total of 212 dentists in Belagavi city took part in both phases of the study, and their responses were used for statistical analysis. Looking at the demographic data first, 110 (51.88%) of the dentists were males, and 102 were females. The mean age of the participating dentists was 44.50 years, and the majority of them (39.62%) belonged to the age-group of 35–45 years. The majority of the dentists taking part in the study (65.56%) had MDS qualifications and specialized in one of the fields of dentistry. An impressive 41.5% (88 dentists) of the participants had their private practice for more than 10 years (Table 1).

Descriptive statistics revealed quite a few findings concerning the change in knowledge, perception, and awareness of the dentists in Belagavi city. When asked about the ideal time to restart the clinic after the lockdown, 88.2% seemed to be undecided about it in the first phase in June 2020. However, the response changed in the second phase in December 2020, where 76.4% of the dentists wanted to reopen within 15 days (Table 2). There was no statistically significant association between years of dental practice and educational qualification with this question (Table 3).

When the participants were asked whether dentists should use personal protective equipment kits (PPE) in their clinic, the responses were similar in both assessment phases. Close to 86.3% answered affirmatively in the first phase, while the number went up to 93.4% in the second phase.

However, almost one-third of the dentists (35.8%) were not aware of what was included in PPE Kits to be used by dentists during dental procedures in phase 1. However, the response changed towards the affirmative in the second phase as 88.6% of participants

Table 1: Sociodemographic characteristics of respondents

	Subcategories	Number in sample (n = 212) (%)
Age (in years)	25–35 years	36 (16.9%)
	35–45 years	84 (39.6%)
	45–55 years	64 (30.18%)
	>55 years	28 (13.2%)
Sex	Male	110 (51.88%)
	Female	102 (48.11%)
Educational qualification	BDS	73 (34.43%)
	MDS	139 (65.5%)
Years of experience	<5 years	28 (13.2%)
	5–10 years	96 (45.28%)
	>10 years	88 (41.5%)

Table 2: Responses of the participants to the different questions

	June 2020 N (%)	December 2020 N (%)
Q1) When do you think is the ideal time to start clinic after the lockdown gets lifted?		
• After 15 days	4 (1.8%)	162 (76.4%)
• After 1 month	19 (8.9%)	34 (16.03%)
• After 6 months	2 (0.9%)	14 (6.60%)
• Not decided	187 (88.2%)	2 (0.9%)
Q2) Do you think dentists should use PPEs?		
• Yes	183 (86.3%)	198 (93.39%)
• No	29 (13.7%)	14 (6.61%)
Q3) Are you aware of the things included in PPEs for dentists?		
• Yes	76 (35.84%)	188 (88.67%)
• No	136 (64.1%)	24 (11.33%)
Q4) How often would you like to change the PPE?		
• After every patient	166 (78.3%)	10 (4.71%)
• After every 3 hours	36 (16.98%)	7 (3.31%)
• At the end of the day	3 (1.41%)	174 (82.2%)
• Depending on the type of patients	7 (3.31%)	21 (9.91%)
Q5) After COVID-19, what precautions you will take while working on patients post-lockdown?		
• IDA guidelines	161 (75.9%)	9 (4.24%)
• WHO guidelines	10 (4.71%)	10 (4.71%)
• Central government guidelines	2 (0.9%)	10 (4.71%)
• All of the above	39 (18.3%)	183 (86.5%)
Q6) Do you feel dentists have a significant role to play in spreading awareness about COVID-19?		
• Yes	146 (68.9%)	190 (89.6%)
• No	66 (31.1%)	22 (10.37%)
Q7) Do the general public/family/friends approach you for suggestions to protect themselves against infectious diseases?		
• Yes	98 (46.3%)	148 (69.79%)
• No	114 (53.7%)	64 (30.21%)
Q8) Do you feel patients have become more aware of self-protection from infectious disease after COVID-19?		
• Yes	78 (36.9%)	183 (86.4%)
• No	134 (63.1%)	29 (13.6%)
Q9) Has the lockdown caused you any kind of financial burden?		
• Yes	158 (74.5%)	173 (81.9%)
• No	54 (25.5%)	39 (18.1%)
Q10) Who should pay for the PPEs?		
• Dentists	9 (4.2%)	11 (5.1%)
• Patients	203 (95.8%)	201 (94.9%)

Table 3: Chi-square test to check for association

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Age	0.78	0.59	0.09	0.42	0.19	0.66	0.13	0.24	0.33	0.51
Sex	0.65	0.07	0.76	0.67	0.33	0.09	0.98	0.19	0.53	0.62
Educational qualification	0.43	0.68	0.08	0.03*	0.00*	0.98	0.55	0.22	0.28	0.06
Years of experience	0.45	0.95	0.34	0.45	0.41	0.03*	0.09	0.21	0.01*	0.48

*($p < 0.05$ = statistically significant)

revealed that they had a fair idea about PPE kits for dentists. The change in their knowledge was found to be statistically significant (Table 4).

To judge the change in knowledge of the dentists, a question was asked to the participants about how often the dentist should change the PPE kit in a day. In the first phase of the survey, 78.3% believed that one should change the PPE kit after every patient. There was a change in responses in phase 2 of the study as 82.2% believed that removing the PPE at the end of the day of a general

dental practice would be sufficient. An association was found between this question and the educational qualification of the dentists as well.

The question about the guidelines the participants would follow to take precautions while working on patients, 75.9% of them said that they would rely on the ones set forth by IDA. However, there was a change in awareness, and 86.5% of the participants said they would look at the guidelines laid down by IDA, WHO, CDC, and the Central Government and try to follow them. An association was



Table 4: McNemar test to check for statistical significance of questions with dichotomous values to compare the responses between June 2020 and December 2020.

	<i>p-value</i>
Q2 June–Q2 December	0.74
Q3 June–Q3 December	0.03*
Q6 June–Q6 December	0.001*
Q7 June–Q7 December	0.33
Q8 June–Q8 December	0.02*
Q9 June–Q9 December	0.54

*($p < 0.05$ = statistically significant)

found between the responses to this question and the educational qualification of the participants.

There were two questions related to the financial aspect of COVID-19. When asked whether they faced some financial burden due to the lockdown, 74.5% of them said yes in the assessment of June 2020. It increased to 81.9% in December 2020. An association was found between the answer to this question and the participants' years of experience ($p < 0.05$). The change in perception was not found to be statistically significant ($p < 0.05$). They were also asked about their opinion on who should pay for the PPE kits once treatment starts. The responses were pretty similar in both assessments. Almost 96% said that patients should bear the costs in the first phase and 95% had the same opinion in the second phase.

Most of the participants believed that dentists have a significant role to play in spreading awareness about COVID-19. In the first Phase, 68.9% answered in the affirmative, which increased up to 89.6% in the second phase. Whether the general public approached the dentists for suggestions to keep themselves protected from infection received a similar response in both the assessments. An association was found between the question and the years of experience of the dentists as well.

When the participants were asked whether the patients have become more aware of the self-protection that one should take from infectious diseases like COVID-19, a marked contrast in the result was observed. Initially, only 36.9% felt so, but the number went up to 86.4% in the assessment of December 2020. The change in perception was found to be statistically significant as well ($p < 0.05$).

DISCUSSION

The ongoing COVID-19 pandemic had escalated worryingly a year ago, with thousands of people losing their lives to it every single day.¹³ The rapid advent of new mutant strains of the virus with a higher infective potential could be majorly attributed to it and it continues to do so at the present. However, the low hospitalization rate and the minimal manifestation of severe complications have been a little comforting. Scientific evidence has suggested that the only way to stop the spread of the disease is through potent vaccines.^{14,15} Thus, the Indian Government started the vaccination drive for the citizens of the country in stages. It also further substantiated the fact that unless the people follow the guidelines laid down by the different authoritative national and international associations and organizations, the pandemic will continue to be a public health concern.¹⁶ Many asymptomatic patients capable of spreading the disease are a

cause of apprehension as well.¹⁷ The study conducted was unique as it assessed the change in the dentists' knowledge, awareness, and perception in Belagavi city over 6 months. The idea behind this design was to judge if there was an improvement among the dentists and whether they had updated their knowledge levels regarding the various aspects of COVID-19. Our study has shown promising results in this regard.

The number of males and females dentists in Belagavi city was almost equal, indicating an absence of any gender disparity. The majority of the dentists were MDS degree holders, which pointed to the fact that most were highly educated. Dentistry took a hit during the pandemic, and even India was not spared from its implications. It was established that one of the main routes of transmission of COVID-19 from one person to another was in a dental setup, through the aerosols used in different dental procedures.¹⁸ Therefore, most Central Governments instructed dentists to stop elective procedures and only treat emergency cases.^{16,19} Since there was a lot of apprehension and anxiety among the dentists themselves about the disease and how it could infect their family members and friends, most of them were not sure of the ideal time to reopen dental clinics when the state was in lockdown in the first phase of the survey in June 2020. However, they developed a fair idea of the functioning of the dental clinics by December 2020, which resulted in a change in response to reopening dental clinics within 15 days of removing lockdown. The increase in hand hygiene, sanitization, and other special precautionary measures like rinsing the mouth with an antimicrobial mouthwash before starting any procedure contributed significantly to this change.²⁰⁻²³ The use of PPEs in the dental setting has been a topic of discussion in almost all the research-based studies done concerning COVID-19. The importance of having appropriate knowledge and awareness about PPE is imperative at this time. This study revealed that the dentists were well-aware of the importance of using PPE in both phases of the study. However, there was a drastic improvement in knowledge of what should be included in the PPEs for dentists. The answers were not very convincing in phase 1, as most of them talked about N95 masks and face shields. On the other hand, in phase 2, the participants said they had enough knowledge of the PPE gowns, eyewear, N95 masks and face shield, and respirator masks. Thus, a major upgrade in knowledge was noticed, and it was found to be statistically significant as well. In a study conducted by Consolo et al.,²⁴ it was revealed that there were a considerable number of dentists who were waiting for directives regarding the use of the correct kind of PPE. Moreover, 77% of them increased the use of PPE kits from what they used to before the pandemic, although the safety of it was not ascertained. There was a lot of speculation about the varied guidance being given to the use of PPE kits in different geographical regions. Healthcare workers felt that the directives were politicized and there was a shortage of protective equipment which was actually being hidden.^{25,26} However, the different types of PPE kits reaching different countries could be a reason for the ambiguity in knowledge regarding it. The question about how often should a dentist change the PPE kits received different opinions. In phase 1, the dentists were not aware of the guidelines and were anxious about the spread of the disease. So, most of them said that it should be changed after every patient, irrespective of the procedure. The responses improved in the second phase, as the answers were according to the guidelines laid down by the regulatory bodies. In fact, according to the latest recommendations

of the Indian Dental Council, PPE kits should be changed when a dentist exits a patient area at the end of the day or when the PPE gets too soiled and dirty due to multiple aerosol-generating procedures.²⁷ The guidelines to be followed by the dentists in order to take precautions against COVID-19 have been changing with the improvement in the knowledge about the various aspects of the virus. A similar trend was observed in this study as well. In the initial survey of June 2020, most participants said they would follow the Indian Dental Association guidelines. However, in December 2020, additional guidelines by the Centers of Disease Control, World Health Organization, and the Ministry of Health of the Central Government also gained acceptance traction.^{28,29} These guidelines help increase the dentist's knowledge in prevention practice so that they can play a vital role in stopping the further spread of the disease. The financial impact of COVID-19 was another aspect that raised some concern in this study. In both phases of the study, the participants felt a financial burden due to the pandemic. A similar result was observed in a survey conducted by the Irish Dental Association³⁰ where more than 75% of the dentists said that their income reduced by 70% and they expected it to become 90–100% if the pandemic continued in the same scale. A survey done by the British Dental Association³¹ yielded responses along the same lines as well. Some dentists in Belagavi city even feared that they might have to shut down their clinics to recover the financial losses that occurred during this difficult time. However, this impact was less profound in the dentists with an MDS degree which showed that they were more financially secure to sustain themselves for longer. The financial situation was further substantiated by the question about who should pay for the PPE kits if they were needed for each treatment. Almost all of them said that it should be the patients themselves as it would become challenging to bear the costs of PPE additionally when almost everyone was going through a financial crunch. When the participants were asked whether they felt that dentists had a key role in educating the people about the precautions to stop the spread of the disease, most responded positively. The 'YES' response went up from 68.9% in phase 1 to 89.6% in phase 2, and this change was statistically significant. A similar result was observed in the study done by Yousef Khader et al.¹² where 97.8% of the dentists believed that they should spread education and awareness about the disease to control it eventually. In the present study, it was also reflected that the general public approached dentists for information about protection from COVID-19, which indicates that society acknowledges the role of the dentists in this fight against the pandemic.

There were certain limitations of the study that might have affected the quality of the results. The sample size taken is small. However, the fact that the whole of Belagavi city was in complete lockdown in the first phase of the study during June 2020 was the main reason for it. The same dentists were approached in the second phase in December 2020 when the lockdown was lifted, keeping the same sample size. Certain aspects of COVID-19, especially the ones related to vaccination and proper precautionary protocols, could also have been missed in the study. The study started when the pandemic was in its nascent stage and at its peak as well, and much information was not available. Since the same questionnaire was used to check for the change in knowledge, awareness, and perception, it was not modified in the study's second phase. The data collected was of a self-report type and was dependent on the respondent's honesty as well. This may cause a certain amount of bias in the study.

CONCLUSION

In conclusion, the study pointed out the fact that there was an adequate change in knowledge, awareness, and perception about COVID-19 among the dentists in Belagavi city, Karnataka in a positive direction when the study was conducted in December 2020 as compared to June 2020. The greater availability of information and the declaration of new and definite guidelines with improved adaptability to it played a significant role in doing so. Thus, dentists are better equipped to restart their dental practices with all the available safety measures.

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