

# Awareness of COVID-19 among dental professionals working at Karnataka state government hospitals and its impact on dental health services of patients - A cross-sectional survey

Dr. Patil Anandkumar\*, Dr. Shah Rutvi. BDS\*\*, Dr. Shapeti Suresh<sup>+</sup>, Dr. Gulshetty Manoj kumar<sup>++</sup>, Dr. Hogepatil Sayali\*\*.

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### **Abstract:**

**Context:** Health professionals are at a high risk for developing infection and being potential carriers of the disease owing to the widespread transmission of COVID-19.

**Aim:** To evaluate awareness of COVID-19 among dental health professionals working in Karnataka state government hospitals and its impact on dental services towards the treatment and prevention.

**Settings and Design:** A cross-sectional questionnaire study

**Materials and method:** A survey was undertaken among the dental professionals working in Karnataka state government hospitals. The questionnaire was validated and comprised of three sections namely demographic details, awareness of dental professionals towards COVID-19 and its impact on dental health services offered.

**Statistical analysis used:** The obtained data was collected and was statistically analysed using SPSS software (version 20.0 Chicago IL, USA). Using chi-square test, the association between the variables was evaluated and a p-value below 0.05 was considered as statistically significant.

**Results:** All the participating professionals exhibited high level of awareness against COVID-19. Nearly 73.91% professionals were assigned COVID-19 duties, however only 33.04% had attended a training programme on the management of these patients. About 65.22% of the respondents stated that PPE kits and sanitisers provided by the government were not adequate.

**Conclusions:** Dental professionals had adequate knowledge and awareness about COVID -19, however many of them were not adequately trained to manage and treat such kind of patients. COVID-19 has impacted dental health services utilization by patients and the overall social, psychological well-being of dental health professionals.

**Key-words:** COVID-19, Dental professionals, Impact, Awareness

**Key Message:** Due to COVID-19, emphasis should be laid on a training program and sufficient number of PPE kits and sanitizers should be made available to the professionals to maintain

the safety and health. Urgent government attention is required to address the anxiety and stress faced by dental health professionals.

### **Introduction:**

In December 2019, there was an outbreak of cases of pneumonia with unknown origin in Wuhan, China, which was designated by the scientists as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).<sup>1</sup> It was declared as a Public Health Emergency of International Concern<sup>2</sup> by WHO due to its unrestrained spread and the outbreak was termed as COVID-19. COVID-19 is highly infectious and the main clinical symptoms are fever, non-productive cough, myalgia, pneumonia and fatigue, whereas the symptoms less common are headache, haemoptysis, diarrhoea and sputum development.<sup>3,4</sup> Age and comorbid conditions have been identified as risk factors for poor outcome of the disease.<sup>4</sup>

Predominantly the transmission is through contact spread via droplets, even though airborne transmission has not been exempted.<sup>5,6</sup> According to the guidelines issued by Occupational Safety and Health Administration (OSHA), dental health professionals are at a higher exposure risk category as they work in close vicinity to the oral cavity and are exposed to a wide range of aerosol generating procedures.<sup>7</sup> Moreover, in a dental office transmission may also occur by touching contaminated work surfaces through indirect contact.<sup>8</sup> The standard infection control measures used in routine dental office might not be effective to prevent the spread of COVID-19, especially in cases when patients in the incubation period are unaware of the

infection, or do not disclose the information.<sup>9</sup>

Considering these factors, a proper understanding of symptoms, modes of transmission, exposure, methods of prevention, use of personal protective equipment, history taking and patient treatment is mandatory to develop protocols for dental professionals to identify cases and prevent further spread of infection to the patients and health care providers.<sup>8</sup> Dental health professionals should update their knowledge and follow standard infection control practices to prevent the transmission of infection.<sup>8</sup> The dental institutions in India were directed by the health authorities to suspend general non-emergency dental care while offering only emergency dental services.<sup>10</sup>

Hence, it is crucial to assess how dental emergency institutions respond to the changes in utilization of health services due to the COVID-19 pandemic.<sup>6</sup> In order to promote management of COVID-19 outbreak in India, there is a vital need to understand health professionals and public's awareness regarding the outbreak. To assure final success, people's adherence to the standard control measures is essential, which is mainly affected by their knowledge, awareness, attitudes, and practices (KAP) pertaining to COVID-19 in compliance with KAP theory.<sup>11</sup>

In this study, we aimed to assess the Knowledge, Attitude, and Practice towards COVID-19 of dentists working in

Karnataka state government hospitals and also to assess the impact of pandemic on the utilization of dental health services by patients.

### **Methodology:**

A comprehensive cross-sectional survey was undertaken to evaluate the awareness and impact of COVID-19 among the dental health professionals working in state government hospitals. After obtaining ethical approval from the institutional review board, the questionnaire was validated by a pilot study. The prepared questionnaire was distributed amongst 20 dental healthcare professionals to assess the validity and effectiveness of the survey. The necessary changes were made, after receipt of the inputs and the final survey form was distributed.

The self-prepared questionnaire comprising of 26 questions was distributed by a google form link which was circulated using social media platforms like “WhatsApp” and “Facebook” among the various dental health professionals working in Karnataka state run government hospitals. The participants were restricted to one state, and the survey link was distributed amongst dental professionals working in state. Dentists who agreed to participate in the survey, were encouraged to fill the questionnaire via clicking the link. The link included a brief introduction and statements of maintaining confidentiality and notes for filling the questionnaire.

The survey constituted of three parts. **Section one:** consisted of the demographic profile, qualification and experience of the dental professionals. Whereas **section two:** included ten questions on the

awareness of dental professionals, (AW1-AW4) regarding the symptoms, modes of transmission and exposure of COVID-19, (AW5-AW7) on the methods of prevention to curb the spread of infection and (AW8-AW10) regarding patient treatment, data entry and payment option. **Section three:** included questions on the impact of COVID-19 on dental professionals and on health services imparted to the patients. It constituted of 16 questions, pertaining to the average percentage of emergency procedure dental patients before and after COVID-19, workshop/training programme attended, assignment of COVID-19 duties, use of personal protective equipment's and sanitisers, impact of COVID-19 on the financial stability and on the other domains of personal, social and family life of the individuals.

The obtained data was collected and was analysed statistically using SPSS software (version 20.0 Chicago IL, USA). Also, comparison of the gender, qualification of the participants and experience was done with the level of awareness and on the impact of COVID-19. Using chi-square test, the association between the variables was evaluated and a p-value below 0.05 was considered as statistically significant.

### **Results:**

A total of 115 dental professionals participated in the survey. The study population constituted of 39.13% (45) male and 60.87% (70) female participants. According to the qualifications, 54.78% were BDS and 45.22% were MDS practitioners. Among the respondents, more than one third (43.48%) had an experience of 0 - 10 years, 19.13% had an experience

of 10 - 15 years and 37.39% had an experience of above 15 years (Table 1).

Table 2 shows the awareness of dental professionals working in state government hospitals regarding COVID-19. All participating dental professionals were aware of the COVID-19 infectious disease. Also, 100% of the respondents were aware of the possible routes of transmission and stated that dental health professionals are at a higher risk of exposure. Amongst them 99.13% were aware of the symptoms and the isolation period involved.

With regard to the prevention of infection, 96.52% of the participants stated that the use of personal protective equipment (PPE) and 95.65% agreed that frequent hand sanitisation can help curb the transmission of infection. Responding to a question on patient treatment, all the participants emphasized that the dentist should take proper medical and travel history prior to consultation. Also, majority of dentists (97.39%) stated that dental personnel with flu-like symptoms should not be permitted to work with patient and 99.13% of them preferred digital method over conventional for consultation, data entry and payment (Table 2).

When comparison of gender was done with the awareness, female participants showed higher awareness compared to males when asked regarding the denial of work of dental personnel with flu-like symptoms. The difference was statistically significant using the chi-square test ( $P 0.0290$ ). Whereas, no statistically significant difference was found with respect to other questions (Table 3) and on comparing qualification

of the participants and years of practise with awareness.

Table 4 shows the impact of COVID-19 on dental professionals and on health services imparted to the patients. About 94.78% of the respondents noted a decrease in the number of patients reporting to the health centre per day and 81.74% stated that the average percentage of emergency procedure dental patients declined to less than 30% after COVID-19. With respect to workshop/training programme attended, 66.96% of the population had not attended any training programme on the management of COVID-19 patient, whereas 53.91% of the study population had undergone a training programme on safe donning and doffing of PPE. However, 73.91% of the professionals in state run government hospitals were assigned COVID duties, pertaining to swab collection (37.65%) and isolation ward monitoring(36.47%). They managed the emergency procedure dental patients by telephonic consultation and postponement of appointment.

Furthermore, the response of 65.22% participants showed that PPE kits and sanitisers provided by the government were not adequate, and there was no change observed in the average use of PPE kit following COVID-19 by 80.00% of the dentists. About 82.61% of the dentists were not willing to treat non-emergency patients with proper preventive measures if allowed, 52.17% felt sometimes anxious and stressed of contracting the disease on duty. COVID-19 affected the personal, social and family life of 82.61% people and financial stability of 29.57% of the respondents. Majority of the health professionals said

that a person known to them had been infected and cured and in addition they also knew a person who was infected and died of the disease. All of participants felt that the awareness of the general public is very important to curb the transmission of infection (Table 4).

When the comparison of the impact was done with the qualification and gender of the professionals, no statistically significant difference was found.

Furthermore, when comparing the impact with years of experience, statistically significant difference was observed when asked regarding the training program attended. Majority of individuals with more than 15 years of experience had attended a training program and the least was attended by dentists with 10-15 years of experience (P 0.045). When it came to assignment of COVID duties, dentists with 0-10 years of experience handled maximum duties (P 0.038). Also a wide range of dentists with 0-10 years of experience stated that there was no change observed in the average use of PPE kit following COVID-19 (P 0.030). Whereas, majority of the dentists with experience of above 15 years stated that PPE kits and sanitisers provided by government were not adequate (P 0.000) (Table 5).

### **Discussion:**

Health professionals are at high risk for developing infection and being potential carriers of the disease owing to the widespread transmission of COVID-19. However, the repercussions of COVID-19 on the dental professionals working in various government hospitals in Karnataka state, India and its impact on dental

services offered to the patients has not been previously evaluated. So, the present study emphasizes on the awareness of COVID-19 among dental professionals and its impact on dental health services offered. The results of the study will be helpful to public health decision makers and health professionals, in identifying the potential problems encountered by the dental health care workers, overcome them and develop a strategy aimed at patient care and prevention of spread of infection.

The findings of the present study showed that, all the participating professionals exhibited high level of awareness against COVID-19. Wherein, all the practising dentists were aware of the infection, possible routes of transmission and chances of exposure. Whereas, 99.13% of the respondents showed awareness regarding the symptoms caused and the isolation period involved. Also, more than 95% of the study population showed awareness when asked regarding preventive measures, history taking, patient treatment, data entry and modes of payment.

A similar study conducted by Khader Y et al <sup>12</sup> stated that majority of dentists were aware of COVID-19 symptoms, identification of high risk patient, modes of transmission and preventive measures which were similar to the results of the present study. Also, 96.2% of the dentists were aware of frequent hand sanitisation and 92.9% showed awareness regarding the use of personal protective equipment's, which was similar to the results of our study in which 95.65% and 96.52% of the dental professionals showed awareness respectively.

Coming to the impact of COVID-19, the findings of the present study showed that there was a decrease in the number of patients reporting to the health centre per day and the average percentage of emergency procedure dental patients declined to less than 30% after COVID-19. The results of this study are similar to a study done by Huaqiu Guo et al, which stated a 38% decrease in patients requiring emergency dental care at the beginning of the epidemic and the decline in non-emergency cases to three-tenth of the pre epidemic period.<sup>6</sup>

In the present study, nearly two third of the dentists had not attended any training programme on the management of COVID-19 patient. However, a wide range of professionals (73.91%) were assigned COVID duties pertaining to swab collection and isolation ward monitoring. They handled the emergency procedure dental patients by telephonic consultation and postponement of appointment. New strategies like tele-dentistry can help health professionals assist patients with no additional risk of cross infection. It can also establish a balance between the safety of healthcare workers along with providing optimal dental treatment to patients in need of emergency intervention.<sup>8</sup>

The results of the study showed that PPE kits and sanitisers provided by the government were not adequate and due to which there was no change observed in the average use of PPE kit following COVID-19. A wide range of dental professionals were not willing to treat non-emergency patients, the reason for this can be attributed to the stress and anxiousness seen among the professionals of contracting the disease

on duty. This findings are similar to a study done by Ahmed MA et al <sup>13</sup>, which stated that 78% of the dental practitioners were stressed and anxious by the impact of COVID-19.

Also, participants of the present study stated that COVID has affected all three domains of their personal, social and family life. Along with emphasizing on the awareness of general public to curb the transmission of infection.

According to CDC guidelines, dental professionals should gain knowledge regarding the infection prevention and control (IPC). Healthcare workers dealing with the suspected or confirmed COVID-19 cases, should be given clear instructions and undergo training to use personal protective equipment (PPE) like face mask, protective eye glasses, face shield, gloves and protective clothing.<sup>7</sup>

This survey shows the awareness and impact of COVID-19 among the participants which will be helpful in developing a strategy aimed at patient care and prevention of transmission of infection. The current survey also emphasis on the need of a workshop/training program pertaining to the management of COVID-19 patient, usage of PPE and an increase in the number of PPE kits and sanitisers provided by the government.

#### **Conclusion:**

1. Dental professionals working at Karnataka state government hospitals have adequate knowledge and awareness about COVID -19, however many of them are not adequately trained to manage and treat such kind of patients.

2. Dentists emphasised on the importance of awareness and knowledge among general public about COVID-19 to control the spread of infection.

3. To develop a treatment protocol aimed at providing optimum patient care and prevention of spread of infection, along with maintaining the safety of health care professionals.

4. Emphasis should be laid on a training program regarding the management of COVID-19 patient and use of PPE.

5. Sufficient number of PPE kits and sanitizers should be made available to the health care professionals, to help them provide efficient patient care.

6. COVID-19 has impacted overall dental health services utilization by patients, limiting to only emergency dental treatment procedures.

7. COVID-19 has impacted the overall social, psychological well-being of dental health professionals which requires urgent government attention to address anxiety and stress faced by dental health professionals working in government hospitals.

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**Tables:**

**Table 1: Demographic profile, qualification and experience of the dental professionals.**

Profile	No of participants	Percentage
<b>Gender</b>		
Male	45	39.13
Female	70	60.87
<b>Qualifications</b>		
BDS	63	54.78
MDS	52	45.22
<b>Experience</b>		
0 - 10 years	50	43.48
10 - 15 years	22	19.13
Above 15 years	43	37.39
Total	115	100.00



**Table 2: Awareness of dental professionals working in state government hospitals regarding COVID-19**

Questions regarding awareness	Yes %	No %
AW1. Are you aware of the latest pandemic infectious disease called COVID-19?	100.00	0.00
AW2. Do you agree that it causes illness that could range from common cold to more severe respiratory problems like pneumonia?	99.13	0.87
AW3. Do you agree that it can transmit through direct contact with oral fluids and blood, contact between droplets or aerosols and through indirect contact with contaminated surfaces?	100.00	0.00
AW4. Do you think that dental health professionals are at high risk of exposure due to their work involving persistent exposure to blood, saliva and face to face communication with patients?	100.00	0.00
AW5. Person if exposed to someone who has been diagnosed with the COVID-19 virus, should be isolated in a safe location immediately for a period of 14-21 days.	99.13	0.87
AW6. Can PPE like mask, dental goggle, face shield and gloves prevent the spread of infection?	96.52	3.48
AW7. Can frequent hand sanitisation by using soap or alcohol based hand rub prevent the infection?	95.65	4.35
AW8. Before consulting the patient, should the dentist take proper medical or travel history?	100.00	0.00
AW9. Dental personnel with flu-like symptoms should not be permitted to work with the patient.	97.39	2.61
AW10. Should digital method be preferred for consultation, data entry and payment option?	99.13	0.87



**Table 3: Comparison of male and female respondents with awareness by using chi-square test**

Questions	Male	%	Female	%	Total	%	Chi-square	p-value
AW1	45	100.00	70	100.00	115	100.00	-	-
AW2	44	97.78	70	100.00	114	99.13	1.5690	0.2100
AW3	45	100.00	70	100.00	115	100.00	-	-
AW4	45	100.00	70	100.00	115	100.00	-	-
AW5	45	100.00	69	98.57	114	99.13	0.6480	0.4210
AW6	44	97.78	67	95.71	111	96.52	0.3470	0.5560
AW7	44	97.78	66	94.29	110	95.65	0.8030	0.3700
AW8	45	100.00	70	100.00	115	100.00	-	-
AW9	42	93.33	70	100.00	112	97.39	4.7920	0.0290*
AW10	45	100.00	69	98.57	114	99.13	0.6480	0.4210

\*p<0.05

**Table 4: Impact of COVID-19 on dental professionals and on health services imparted to the patients**

Impact	No of professionals	Percentage
<b>Average number of dental patients visiting your health centre per day after COVID-19</b>		
Increased	4	3.48
Decreased	109	94.78
No change	2	1.74
<b>Average percentage of emergency procedure dental patients visiting your health centre per day before COVID-19</b>		
Less than 30%	40	34.78
Between 30-60%	54	46.96
Above 60%	21	18.26
<b>Average percentage of emergency procedure dental patients visiting your health centre per day after COVID-19</b>		
Less than 30%	94	81.74
Between 30-60%	18	15.65
Above 60%	3	2.61
<b>Any formal awareness and training programme to prevent, identify, manage and refer COVID-19 has been given?</b>		
Yes	38	33.04
No	77	66.96

<b>Have you undergone any workshop/training programme regarding safe donning and doffing of PPE?</b>		
Yes	62	53.91
No	53	46.09
<b>Have you been assigned any COVID-19 duty?</b>		
Yes	85	73.91
No	30	26.09
<b>If yes, what type of duty is assigned?</b>		
Awareness programme for public	15	17.65
Field surveys	7	8.24
Isolation ward monitoring duty	31	36.47
Swab collection	32	37.65
<b>If yes, how you managed dental treatment procedures of emergency /non-emergency patients?</b>		
Alternate staff	16	18.82
Not attended	8	9.41
Postponed appointment	30	35.29
Telephonic consultation	32	37.65
<b>Are enough number of preventive PPE kits, sanitizers provided by government?</b>		
Adequate	40	34.78
Inadequate	75	65.22
<b>Has the average use of PPE kit for dental examination and treatment procedures changed after COVID-19?</b>		
Increased	13	11.30
Decreased	10	8.70
No change	92	80.00
<b>Are you ready / willing to treat non-emergency patients/procedures with proper preventive protocol if allowed?</b>		
Yes	20	17.39
No	95	82.61
<b>Do you feel anxious and stressed of contracting disease on duty?</b>		
Yes	10	8.70
Some times	60	52.17
No	45	39.13
<b>Has COVID affected your financial stability?</b>		
Yes	34	29.57
No	81	70.43
<b>Does COVID affect your</b>		

Personal life	2	1.74
Family life	5	4.35
Social life	13	11.30
All	95	82.61
<b>Did any of your known person infected and died of COVID-19 disease?</b>		
No	22	19.13
Infected but cured	48	41.74
Infected and died	8	6.96
Both B & C	37	32.17
<b>Do you feel awareness of public is very much required to control COVID-19</b>		
Yes	115	100.00
No	0	0.00
Total	115	100.00

**Table 5: Comparison of the years of practice of professionals with the impact of COVID-19**

Impact	0-10yrs	%	10-15yrs	%	>15yrs	%	Chi-square	p-value
<b>Any formal awareness and training programme to prevent, identify, management, referral of COVID-19 has been given?</b>								
Yes	16	42.11	3	7.89	19	50.00	6.1830	.045*
No	34	44.16	19	24.68	24	31.17		
<b>Have you been assigned any COVID-19 duty?</b>								
Yes	19	63.33	4	13.33	7	23.33	6.5380	.038*
No	31	36.47	18	21.18	36	42.35		
<b>Are enough number of preventive PPE kits, sanitizers provided by government?</b>								
Adequate	29	72.50	5	12.50	6	15.00	21.5150	.000*

Inadequate	21	28.00	17	22.67	37	49.33		
<b>Has the average use of PPE kit for dental examination and treatment procedures changed after COVID-19?</b>								
Increased	6	46.15	6	46.15	1	7.69	10.7080	.030*
Decreased	3	30.00	3	30.00	4	40.00		
No change	41	44.57	13	14.13	38	41.30		

\*p<0.05

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- \*- Professor and Head of the Department,  
\*\*- Post Graduate Student
- Department of Prosthodontics and Crown and Bridge,  
KAHER'S KLE V.K. Institute of Dental Sciences, Belagavi-590010. Karnataka, India
- + - Deputy Registrar,  
Public Health Foundation of India,  
IIPH, SIHFW Premises, Leprosy Hospital Compound, 1 st Cross, Magadi road, Bengaluru- 560023.
- ++- PGDPHM Student,  
Public Health Foundation of India, IIPH Bengaluru campus, Bengaluru- 560023.