

# Covid-19 Pandemic: Knowledge and Preparedness of Oral Health Care Professionals in Clinical Setting

Dr. Vani Chappidi, Dr. Alekya Oddeti  
Department of Oral Medicine and Radiology,  
Sri Sai College of Dental Surgery, Vikarabad, Telangana

## Abstract:-

**Background:** Corona virus disease 2019, is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which is a single stranded RNA virus of 60–140 nm, belonging to the  $\beta$ -Coronavirus genus. The Indian Dental Association (IDA) and Indian Endodontic Society in a joint position statement strongly recommended that a dental practitioner should not treat a patient in his/her dental office unless they can comply with the emergency preparedness checklist. It is important to implement sound prevention measures in dental clinics and optimize their clinical practice to the changing trends to ensure safe and risk free practice. **Aim:** The current study aimed to assess the knowledge regarding, COVID19 and infection control measures among dental practitioners in the state of Telangana. **Materials and methods:** A cross-sectional questionnaire-based online survey with convenience sampling was conducted. The questionnaire consisted of 20 self-prepared questions. A validation questionnaire was sent to the oral health-care professionals practicing across Telangana. Participation in the study was totally voluntary. A total of 411 responses were received. These responses were analyzed statistically. **Results:** The present study revealed that majority of the subjects had high and moderate level of knowledge, yet there were notable deficiencies in some of the important aspects. **Conclusion:** Findings of the present study aids in designing effective infection prevention and control strategies among dental practitioners. Dentists have the duty to protect the public and themselves from this novel infection while maintaining high standards of infection control.

**Keywords:-** Knowledge, COVID 19, Infection Control, SARS-CoV-2.

## I. INTRODUCTION

Corona virus disease 2019 (COVID19), is a novel disease of global concern and has evolved rapidly into a public health crisis. It is caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2), which is a single stranded RNA virus belonging to the  $\beta$ -Coronavirus genus. It is known, to exploit angiotensin-converting enzyme 2 receptor (ACE2), which is found in the lower respiratory tract.<sup>1,2</sup> The virus is transmitted through droplets, and the spread mainly occurs through sneezing, coughing and salivary contamination.<sup>1,2</sup> The propagation of infected droplets occurs through contact with infected subjects, with

or without clinical signs of COVID19.<sup>3,4</sup> Previous observational studies have reported that even an asymptomatic patients in the incubation phase or healthy carriers can transmit the virus.<sup>3-6</sup> The human-to-human transmission of COVID19 created an alert with the increasing number of cases reported worldwide. The basic concept in mode of viral transmission is mainly through ingestion/inhalation/direct mucous contact with saliva droplets, aerosols and respiratory fluids; they can also survive on objects, surfaces that are exposed to infected body fluids.<sup>3,4</sup> Since the viral load contained in the human saliva is very high, it may serve as a potential source of infection.<sup>3</sup> Owing to the nature of the dental procedures and treatments, dental office seems to be at high risk for this nosocomial infection and dental practitioner are considered to be at high risk.<sup>4-8</sup> The risk of cross-infection in dentistry has been described considerably high<sup>9</sup> since splatters and aerosols produced during routine dental treatments contribute to increased risk.<sup>10</sup> Dentists are often the first line diagnosticians for oral diseases, and are in close contact with patients. Thereby, Centre of Disease Control (CDC) issued interim guidelines besides following the standard precautions which urged dental practitioners to postpone elective procedures, non urgent dental visits, surgeries and to contact the patient before the initial visit. The Indian Dental Association (IDA) and Indian Endodontic Society in a joint position statement strongly recommended that a dental practitioner should not treat a patient in his/her dental office unless they can comply with the emergency preparedness checklist.<sup>11</sup> This checklist includes disinfection and sterilization protocol, personal protective equipment (PPE) including protective outerwear, N95 face masks and face shields.<sup>11</sup> This advisory also stated those patients only requiring emergency care should be considered for treatment in a well equipped dental clinic adopting strict protective measures; rest all patients should be tele-consulted, managed pharmacologically and scheduled for the care later on priority once the regular dental services are restored.<sup>11</sup> Taking into consideration the severity of the COVID19 pandemic, and the interim guidelines by dental associations and health authorities, it is essential that dentist may practice cautiously and be prepared once the practice resumes. It is important to implement sound prevention measures in dental clinics and optimize their clinical practice to the changing trends to ensure safe and risk free practice. Hence, the current study aimed to assess the knowledge regarding, COVID19 and infection control measures among dental practitioners in the state of Telangana.

## II. AIM OF THE STUDY

The aim is to assess Knowledge and preparedness of dentists across Telangana during COVID-19 pandemic.

## III. MATERIALS AND METHODS

A cross-sectional questionnaire based online survey with convenience sampling was conducted. The survey questionnaire was prepared during the lock down in India, to assess their knowledge, and practices during COVID-19 pandemic and what changes can be incorporated in their dental practices once the services resume. The questionnaire consisted of 20 self-prepared questions and had two parts. The first part focused on the demographics that included personal information regarding age and gender of the individuals. The second part included questions that assessed knowledge and practices of dentists practicing across Telangana. A pilot study was done for identifying flaws in the questionnaire. Appropriate amendments were done in the questionnaire. A validation questionnaire was sent to the oral health-care professionals practicing across Telangana. The questionnaire was shared in the form of Google document through various channels such as E-mails, WhatsApp, Facebook and Messenger to 623 dental practitioners in Telangana. Participation in the study was totally voluntary. A total of 411 responses were received. These responses were analyzed statistically.

## IV. RESULTS

STATISTICAL ANALYSIS was done using SPSS (Statistical Package for Social Sciences) 25.0. Descriptive statistics and chi square test were performed. Confidence interval was set at 95%. P value < 0.05 was considered statistically significant.

Out of a total of 411 participants who responded, there were 180 males (43.8%) and 231 females (56.2%). Among these participants 17%(70) have completely shut down their clinics, 29% (123) were doing all emergency procedures, 36.7% (151) were doing only emergency procedures not involving aerosols, 16.3% (67) were performing only tele consultations and referrals.

**Table 1: Age distribution among participants**

Age	Frequency	Percent
<25 years	89	21.7
>45 years	55	13.4
25	1	0.2
25 yrs	1	0.2
25-35 years	190	46.2
36-45 years	75	18.2
Total	411	100.0

Irrespective of their qualification and years of experience, most of the participants, 290 (70.6%), were aware of dental guidelines issued by various dental associations pertaining to dental management during Covid-19 pandemic. About 121(29.4%) of the participants were unaware of the guidelines. Among the study participants 39.7% believed that ADA, IDA, WHO and respective specialty associations have the right to issue the guidelines for oral health care professionals during pandemic, 23.4% believed that WHO have the right, 16.5% believed that IDA have the right, 12.7% believed that respective specialty associations have the right, and 7.8% believed that ADA have the right.

**Table 2: Gender distribution among participants**

Sex	Frequency	Percent
Female	231	56.2
Male	180	43.8
Total	411	100.0

Among the study participants 33.6% believed that the list of emergency procedures should be decided by the dentist himself, 29% believed that IDA should decide, 26.5% specialty associations should decide and 10.9% believed that health ministry should decide.

About 41.1% of the participants believed that the age group between 20-45 years is most likely to remain asymptomatic despite being Covid- positive, 33.1% believed that the age group between 20-45 years, 23.4% believed that the age group between 5-10years, and 2.4% believed that the age group between 50-80years is most likely to remain asymptomatic despite being covid positive.

There was a significant difference between knowledge of the participants regarding procedures requiring mandatory use of respirators N95, FFP2 (filtering half-face protection mask). 16.8% of the participants believed that aerosol generating procedures required mandatory use of N95, FFP2, 10.9% of the participants believed tooth preparation with air turbine hand piece required these, 11.7% believed ultrasonic devices required these, whereas 60.65% of the participants believed that all these procedures required the mandatory use of respirators N95, FFP2.

Most of the participants were aware of the procedures which do not produce aerosols. They revealed knowledge scores of 17.5% for air water syringe, 64% for chemo mechanical caries removal, 6.6% for high speed hand pieces, and 11.9% for polishing cups.

There was a significant difference between knowledge of the participants regarding the use of NSAIDs in managing dental pain emergency during Covid 19 pandemic. 66.2% of the participants recommended ketorolac tromethamine, 19.2% recommended acetaminophen, 9.5% recommended ibuprofen, 5.1% recommended piroxicam in the management of dental pain.

The study participants were aware of the drugs that have been useful but not yet approved by FDA for treatment/ prophylaxis of covid 19. 60.8% believed that azithromycin, chloroquine phosphate, and zinc are useful, 15.8% believed that chloroquine phosphate is useful, 12.9% believed that azithromycin is useful, 10.5% believed that zinc is useful for the treatment/ prophylaxis of covid 19.

Regarding the knowledge of effective disinfectant in a clinical setting against corona virus, 64.5% of the participants recommended 1% sodium hypochlorite, 70% isopropyl alcohol, 15.3% of the participants recommended 70% isopropyl alcohol, 14.6% of the participants recommended 1% sodium hypochlorite, whereas 5.6% of the participants were not aware of any disinfectant effective against corona virus.

Among the study population 65.9% recommended mandatory use of protective outerwear, N95/FFP2 masks, eye wear, negative pressure/ AIIR (airborne infection isolation room), high volume evacuation apparatus while dealing with emergency cases requiring aerosol generating procedures. 18.5% recommended use of only protective outerwear, N95/FFP2 masks, eye wear, 11.2% recommended use of high volume evacuation apparatus and 4.4% recommended use of negative pressure/ AIIR.

Regarding the knowledge of pre procedural rinse effective against corona virus, 65.5% of the participants were of the opinion that 0.2% povidone iodine is effective, 17.3% were of opinion that 2% chlorhexidine, 10.7% hydrogen peroxide is effective whereas 6.6% of the participants were unaware of the pre procedural rinses.

Among the study population 77.6% of the participants thought that both extra oral & intraoral swelling obstructing airway and uncontrolled bleeding should be attended as emergency dental care. 13.1% thought that only diffuse extra oral & intraoral swelling obstructing airway should be attended as emergency dental care, 5.4% thought that uncontrolled bleeding should be attended as emergency dental care, whereas 3.9% thought that acute apical abscess should be attended as emergency dental care.

There was a significant difference in the knowledge of the participants regarding the most effective ways to protect themselves while doing consultation irrespective of their qualification and years of experience. 43.1% recommended all the 3 ways i.e. telling the patient to hold his breath, using intraoral camera at 1 meter distance and using N95 with face shield, 40.9% recommended using N95 with face shield, 9.2% intraoral camera, 6.8% recommended telling patient to hold breath and all (43.1%).

Regarding the knowledge of how long the patients infected with corona virus can be main carriers, 43.8% believed that it is 14 days, 20.7% believed it is 28 days, 20% believed it is 8 days, 15.6% believed it is 5 days.

Among the study population 49.1% were of the view that if the dentist become infected while treating the patients during a pandemic, the dentist should pay for the treatment himself, 17.85% were of the view that health insurance companies should pay, 17.3% were of the view that dental associations should pay, whereas 15.8% were of the view that premium on the services paid by the patients.

Among the study population 292 participants (71%) recommended hydroxychloroquine as a prophylactic measure to the dental team while doing dental emergency procedures, 119 participants (29%) did not recommend.

Regarding incorporation of material or procedures in their respective dental operator, 280 participants (68.1%) wanted to incorporate all the dental operator in their clinics including alcohol based hand rub at the entrance, avoidance of ACs unless equipped with HEPA filters, discouraging patient escorts, modification of existing patient waiting area to allow 1-2 meters of social distancing, non overlapping appointments, providing disposable surgical gowns and gloves to the patient before the treatment starts, thermal screening at entrance, visual alerts posters, cough etiquettes, hand hygiene protocol, providing surgical masks to the patients at the entrance.

**Table 3: showing the statistical association between various questions and age, gender.**

Question	Age (p value)	Gender (p value)
3. Are you aware of the dental guidelines issued by various dental associations pertaining to dental management during covid-19 pandemic	0.001*	0.003*
4. Who all according to you should have the right to issue the guidelines for oral health care professionals during pandemic	<0.001*	0.579
5. Which of the following age group is most likely to remain asymptomatic despite being Covid- positive	<0.001*	0.006*
6. Which of the following procedures require the mandatory use of respirators N95, FFP	<0.001*	0.017*
7. Use of which of the following procedures do not produce aerosols	0.003*	0.840
8. Which of the following NSAIDs are more effective in managing dental pain emergency during cov-19 pandemic	0.001*	0.125
9. During cov19, apart from hydroxyl chloroquine , what other drugs have been observed as useful but not yet approved by FDA for treatment / prophylaxis	0.714	0.049*
10. Which of the following is an effective disinfectant for in a clinical setting effective against corona virus	0.009*	0.125
11. Which of the following is mandatory while dealing with emergency cases requiring aerosol generating procedure	0.001*	0.275
12. Which of the following is an effective pre-procedural rinse against corona virus	0.001*	0.009*
13. What do you think should be attended as emergency dental care	0.005*	0.701
14. Which of the following is the most effective way to protect yourself while doing consultation during cov-19	<0.001*	0.031*
15. Once the symptoms clear in patients infected with coronavirus they can still remain carriers up to	0.001*	0.230
16. Who all according to you should be liable to pay in case a dentist gets infected while treating a patient during a pandemic	<0.001*	0.018*
17. List of emergency procedures should be decided by	0.001*	0.175
18. Would you recommend hydroxychloroquine as a prophylactic measure to the dental team dealing with dental emergencies	<0.001*	0.073
19. Are you currently practicing during the lockdown period	0.223	0.725
20. Which of the following would you like to incorporate in your dental operatory if not already practiced	0.031*	0.375

## V. DISCUSSION

WHO announced corona virus disease 2019 (COVID 19) to be the disease caused by SARS-CoV-2. Subsequently, many countries continued to experience clusters of cases and community transmissions. This led the World Health Organization (WHO) to declare COVID-19 outbreak a pandemic. The rapid and explosive surge of positive cases has led to a significant increase in the demand for medical care. On the infrastructure front, many of the hospitals have actively scaled up their capacity of basic and critical care beds. However, global medical manpower resources are finite. Consequently, many hospital-based healthcare workers have had to work over hours and take on extra shifts. Such stressors have been associated with reduced job performance and fatigue related errors which could harm the patients.<sup>12</sup> In responding to this crisis with a multi-sectorial, equitable and human-rights focused approach, some of the entities have called for voluntary support from professionals with medical backgrounds to manage the pandemic.<sup>13</sup> Though physicians and dentists have different scopes of practice, their trainings share many similarities. The dental student, like his medical counterpart, has to attain proficiency in his understanding of the basic sciences such as anatomy, physiology, pharmacology and microbiology. This is essential given that dentists are expected to competently manage the dental issues of medically compromised patients. Moreover, dentists must be able to effectively manage medical emergencies that may arise in routine dental practices. To this end, many of the dental practitioners would have undergone basic cardiac life support training. Thus, the robust training of clinical medicine in dentistry strengthens the candidature of the dentists to volunteer services for COVID 19 control and spread. The outbreak of COVID19 has significantly affected the practice of dentistry. Dental treatment can generate large amounts of droplets and aerosols mixed with the patient's saliva or blood.<sup>14</sup> This poses a risk to dental professionals as Corona virus has been detected in saliva of infected individuals.<sup>15</sup> Many dentists have therefore discontinued the provision of elective dental treatments, in accordance with the guidelines released by national-level government healthcare authorities such as the Centers for Disease Control and Prevention (CDC). Only limited cases that require emergency dental care continue to be seen. The significantly reduced workload during this pandemic, coupled with robust training in a medical setting, makes the dentist a prime candidate to volunteer in the fight against COVID-19.

According to CDC, in most of the dental clinical setups, providing care for patients needing transmission- based precautions is not possible as they are not designed for or equipped to provide this standard of care due to their lacking on airborne infection isolation rooms(AIIRs) or single- patient rooms, a respiratory protection program and N95 respirators.<sup>16</sup> During this period of the extreme shortage of PPEs, controlling exposures to occupational infections is a fundamental method of protecting health-care professionals and prevent its spread.

The present study revealed that majority of the subjects had high and moderate level of knowledge, yet there were notable deficiencies in some of the important aspects. In the present study, we came to know that irrespective of their qualification, and years of experience, most of the dentists were aware of the dental guidelines issued by various dental associations. Most of the study participants recommended use of mandatory protective equipment like negative pressure/ AIIR, using high volume evacuation apparatus, protective outerwear, N95/FFP2 masks, eyewear, while doing emergency procedures and majority of the participants were performing only emergency procedures not involving aerosols. Majority of the participants were prepared to incorporate all the protective dental operatory in their clinics, and most of them were aware of an effective disinfectant and pre procedural rinse against corona virus. In this study, there was confusion among the dentists regarding who have the right to issue the guidelines for oral healthcare professionals during pandemic. There was difference in opinion between participants regarding effective ways of protecting themselves while doing consultation, and also viral carrier state of the patients. There was also difference in opinion regarding who will decide the list of emergency procedures. 29% of the study subjects had no knowledge regarding hydroxychloroquine toxicity. Hydroxychloroquine is an anti malarial drug reported to be effective in management of COVID19, Apart from mild side effects it is known to induce retinal toxicity. However, there is lack of extensive research to justify its use in the management of COVID19. Taccone F S et al. in their systematic review suggested, only few studies have been undertaken in ill patients to assess this drug and still evidences are needed to suggest hydroxychloroquine as a therapeutic strategy.<sup>17</sup>

In the present study there was confusion among the participants of which age groups remain asymptomatic despite being covid positive. According to a study conducted by De Chang et al., half of the patients that were treated for COVID-19 infection kept shedding the virus for up to 8 days after symptoms have been disappeared requiring 2 weeks extended quarantine even after symptomatic recovery.<sup>19</sup> Shen et al mentioned in their experts' consensus statement regarding diagnosis, treatment and prevention of novel corona virus infection that children up to 17 years mostly were found to be asymptomatic or had mild symptoms with a good prognosis.<sup>18</sup>

In the present study majority of the dentists revealed good knowledge with regard to the procedures requiring mandatory use of respirators, and which dental problems should be attended as emergency dental care. The dental settings, carries high risk of cross infection as the aerosol and splatter, formed during the dental procedures is the potential source for the spread of infection other than direct transmission. Most of the participants aware of the procedures that do not produce aerosols. Majority of the dentists were prepared to pay themselves if they gets infected while doing dental procedures. Majority of the respondents were likely to advice ketorolac tromethamine for the treatment of dental pain emergency. Most of the

study participants were aware of the drugs under trial for the treatment/prophylaxis of covid 19.

## VI. CONCLUSION

The current study emphasizes on, being updated with evidence based information and act upon their professional responsibility to ensure preparedness of the dental practitioners for current and future dental practice against prevention of COVID19 and optimize safety for the well being of themselves and their patients. Findings of the study aids in designing effective infection prevention and control strategies among dental practitioners. Dentists have the duty to protect the public and themselves from this novel infection while maintaining high standards of infection control.

## REFERENCES

- [1]. Zhu N, Zhang D, Wang W, et al. A novel coronavirus from patients with pneumonia in China, 2019. *N Engl J Med.* 2020 Feb 20;382(8):727–733.
- [2]. Chan JF, Yuan S, Kok KH, et al. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. *Lancet.* 2020;395(10223):514–523.
- [3]. To KK, Tsang OT, Yip CC, et al. Consistent detection of 2019 novel coronavirus in saliva. Feb 12. pii: ciaa149 *Clin Infect Dis.* 2020.
- [4]. Kampf G, Todt D, Pfaender S, Steinmann E. Persistence of coronaviruses on inanimate surfaces and its inactivation with biocidal agents. Feb 6 *J HospInfect.*2020;104(3)
- [5]. Meng L, Hua F, Bian Z. Coronavirus disease 2019 (COVID-19): emerging and future challenges for dental and oral medicine. *J Dent Res.* 2020 May;99(5):481–487.
- [6]. Peng X, Xu X, Li Y, Cheng L, Zhou X, Ren B. Transmission routes of 2019-nCoV and controls in dental practice. *Int J Oral Sci.* 2020 Mar 3;12(1):1–6.
- [7]. Spagnuolo G, De Vito D, Rengo S, Tatullo M. COVID-19 outbreak: an overview on dentistry. *Int J Environ Res Publ Health.* 2020;17(6):2094.
- [8]. Lo Giudice R. The severe acute respiratory syndrome coronavirus-2 (SARS CoV-2) in dentistry. Management of biological risk in dental practice. *Int J Environ Res Publ Health.* 2020 Jan;17(9):3067.
- [9]. Volgenant, C.M.C.; de Soet, J.J. Cross-transmission in the Dental Office: Does This Make You Ill? *Curr. Oral Health Rep.* 2018, 5, 221–228.
- [10]. Szymańska, J. Dental bioaerosol as an occupational hazard in a dentist's workplace. *Ann. Agric. Environ. Med.* 2007, 14, 203–207.
- [11]. Endodontic and Dental Practice During COVID-19 Pandemic: Position Statement from Indian Endodontic Society. [Last accessed on 2020 Apr 02].
- [12]. Caruso CC. Negative impacts of shiftwork and long work hours. *Rehabil Nurs.* (2014) 39:16–25.
- [13]. UN Volunteers. Volunteers for Novel Coronavirus (COVID-19) Pandemic Response. (2020).
- [14]. Harrel SK, Molinari J. Aerosols and splatter in dentistry: a brief review of the literature and infection control implications. *J Am Dent Assoc.* (2004) 135:429–37.
- [15]. Azzi L, Carcano G, Gianfagna F, Grossi P, Gasperina DD, Genoni A, et al. Saliva is a reliable tool to detect SARS-CoV-2. *J Infect.* (2020) 81:e45–50.
- [16]. Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 (COVID-19) in Healthcare Settings.
- [17]. Taccone FS, Gorham J, Vincent JL. Hydroxychloroquine in the management of critically ill patients with COVID-19: the need for an evidence base. *Lancet Respir Med.* 2020;8(6):539-541.
- [18]. Shen, K., Yang, Y., Wang, T. et al. Diagnosis, treatment, and prevention of 2019 novel coronavirus infection in children: experts' consensus statement. *World J Pediatr* **16**, 223–231 (2020).
- [19]. Chang D, Mo G, Yuan X, Tao Y, Peng X, Wang FS, Xie L, et al. Time Kinetics of Viral Clearance and Resolution of Symptoms in Novel Coronavirus Infection. *Am J Respir Crit Care Med.* 2020;201:1150-2.