

Original Research

Awareness and knowledge of sterilization protocols among dental clinicians during covid-19

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AIM

To assess the knowledge and awareness of COVID-19 sterilization protocols among the dental clinicians during COVID-19 pandemic.

INTRODUCTION

Dental patients and professionals can be exposed to pathogenic microorganisms that infect the oral cavity and respiratory tract. Dental care settings invariably carry the risk of 2019- nCoV infection due to the specificity of its procedures, which involves face-to-face communication with patients, and frequent exposure to saliva, blood, and other body fluids, and the handling of sharp instruments.¹ The pathogenic microorganisms can be transmitted in dental settings through inhalation of airborne microorganisms that can remain suspended in the air for long periods. [2] Infections could be present through any of these conditions involved in an infected individual in dental clinics. In addition to the infected patient's cough and sneezing, dental devices such as high-speed dental handpiece, high-speed air to drive the turbine to rotate at high speed and work with running water. When dental devices work in the patient's oral cavity, a large amount of aerosol and droplets mixed with the patient's saliva or even blood will be generated. [3] Particles of droplets and aerosols are small enough to stay airborne for an extended period before they settle on environmental surfaces or enter the respiratory tract. A dental professional's frequent direct or indirect contact with human fluids, patient materials,

and contaminated dental instruments or environmental surfaces makes a possible route to the spread of viruses. [4,5] Dental care professionals are at an increased risk of cross infection as well as its transmission while treating the patients. [6] Dental procedures frequently cause bleeding and exposure to infected blood, saliva and aerosol are a known means of infectious disease transmission.

MATERIALS AND METHOD

The main objective of this cross-sectional survey done from 2020 to August 2020 comprising of 111 dental practitioners and post-graduate students across India was to assess the awareness and knowledge of sterilization protocols among dental clinicians during covid-19.

An online questionnaire form was created using Google Forms which comprised of various questions pertaining to the basic questions regarding the knowledge of sterilization protocols. The responses were either dichotomous or multiple-choice type which the respondent could choose either a single option or more than one options. The online form was then forwarded to the dental practitioners and post-graduates practicing in various parts of India via emails and other social media platforms. The form was forwarded to approximately 500 individuals, out of which 111 responded. The questionnaire comprised of 15 questions ranging from general questions like name, email id, whether you are dental practitioner or postgraduate student to more specific questions

evaluating to the knowledge of sterilization protocols.

Other questions were:

1. Are you aware of the sterilization protocols which should be followed especially during these COVID times?
2. Have you heard about the high-volume evacuators?
3. What are High Volume Evacuators suction devices?
4. How often do you use PPE while performing dental procedures?
5. Do you prefer face shields during examining and while performing dental procedures or a protection eyewear?
6. Do you use double gloves for each patient?
7. Do you use pre-procedural rinses for your patients?
8. How effective do you think is chemical disinfection when compared to autoclave?
9. Do you think limiting the use of ultrasonic scalers and rotary instruments per day will decrease the chance of COVID infection spread?
10. Do you think use of conventional hand instruments should be promoted to control the air borne infections?
11. How much time do you wait to treat a COVID recovered patient?
12. Do you use the Ultraviolet Steriliser? How effective do you think it is in achieving sterilization?
13. How do you sterilise the used endodontic files and spreaders?
14. While examining a suspected COVID patient, how do you sterilise the diagnostics after use?

RESULTS

The results of the present study provided an insight regarding the awareness and knowledge of sterilization protocols among various dental practitioners and post-graduates in India. Total 111 practitioners and post-graduates participated in the study from all over India. Overall, 62.2% of the total respondents were dental practitioners and 37.8% were post-graduates (Figure 1). 98.2% individuals were aware of the COVID sterilization protocols, and the rest 0.8% individuals were unaware of the protocols. (Graph 2). 86.5% individuals had heard about the high-volume evacuators whereas rest 13.5% did not know about them (Graph 3). 16.2% individuals believed that high vacuum evacuators were suction devices which could remove a volume of air up to 100 cubic feet per meter, 10.8% individuals believed that they could remove large volume of aerosols and the 73% individuals believed in both the criteria (Graph

4). 79.3% individuals wore PPE in just aerosol producing procedures, 19.8% individuals wore PPE for both aerosol generating and non-aerosol generating procedures and none of the individuals wore it for all regular dental procedures (Graph 5). 86.5% individuals preferred to wear a face shield while examining or performing a dental procedure and 13.5% individuals preferred to wear a protective eyewear for the same. (Graph 6) 42.3% individuals used double gloves for every patient, 36% individuals did not use double gloves for every patient and 21.6% individuals were not sure (Graph 7). 76.4% individuals used a pre-procedural rinse for all the patients, 11.8% individuals did not use a pre-procedural rinse for the patients and 11.8% were not sure (Graph 8). 81.1% individuals disinfected the used diagnostic instruments first with chemical disinfectant followed by autoclave and 18.9% individuals believed that only autoclave was enough for disinfection (Graph 9). 64% individuals believed that Ultraviolet sterilizer is effective in achieving sterilization, 33.3% individuals believed that ultraviolet sterilizer were not effective in achieving sterilization and 23.7% believed that ultraviolet sterilizer isn't effective at all (Graph 10). 28.8% individuals used an ultraviolet sterilizer for sterilizing diagnostics (mouth mirror, probes, occlusal and side mirrors, side and cheek retractor etc.) whereas 68.5% individuals used it for sterilizing the diagnostics as well as glass and polypropylene test tubes and elastics and e-chains and 2.7% used it for only sterilizing elastics and e-chains (Graph 11). 58.6% individuals sterilized the used endodontic files and spreader using a glass bead sterilizer, 18% used 0.5% Hypochlorite and 23.4% used autoclave (Graph 12). 82.9% individuals believed that chemical disinfection is more effective than autoclave and 17.1% believed that chemical disinfection is equally effective as an autoclave (Graph 13). 44.5% individuals believed that limiting the use of ultrasonic scalers and rotary instruments per day could decrease the chances of the spread of COVID 19 and 19.1% individuals did not believe in this whereas the rest 36.4% were not sure (Graph 14). 38.7% individuals believed that promoting the use of conventional hand instruments could control the air borne infections whereas 61.3% did not believe in this (Graph 15). 52.7% individuals waited at least 2 weeks after getting a RT-PCR negative report to treat a COVID recovered patient, 33.6% individuals waited 1 week after getting a RT-PCR negative report and 13.6% individuals started to treat individuals immediately after obtaining the RT-PCR negative report (Graph 16).

Figure 1:

(1) You are

111 responses

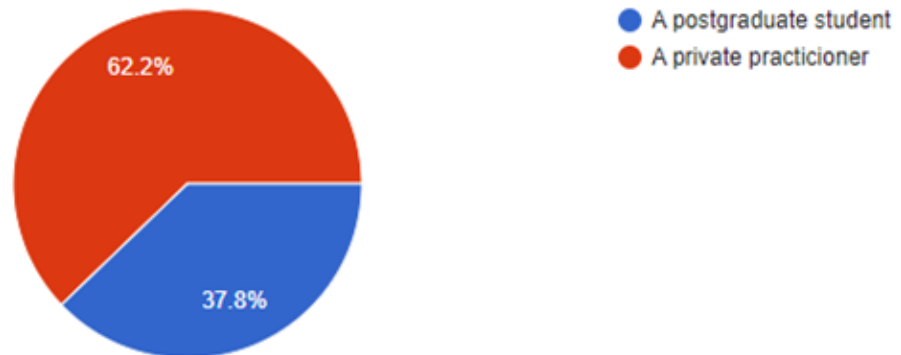


Figure 2:

(2) Are you aware of the sterilization protocols which should be followed especially during these COVID times

111 responses



Figure 3:

(3) Have you heard about the HIGH VOLUME EVACUATOR

111 responses

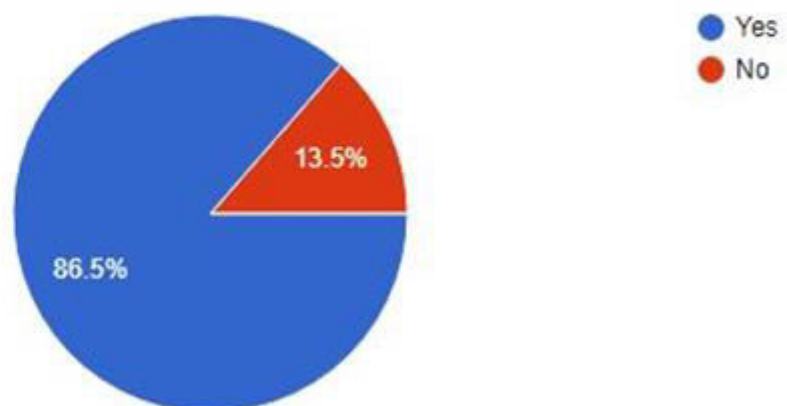


Figure 4:

(4) High Volume Evacuators are suction devices which can

111 responses

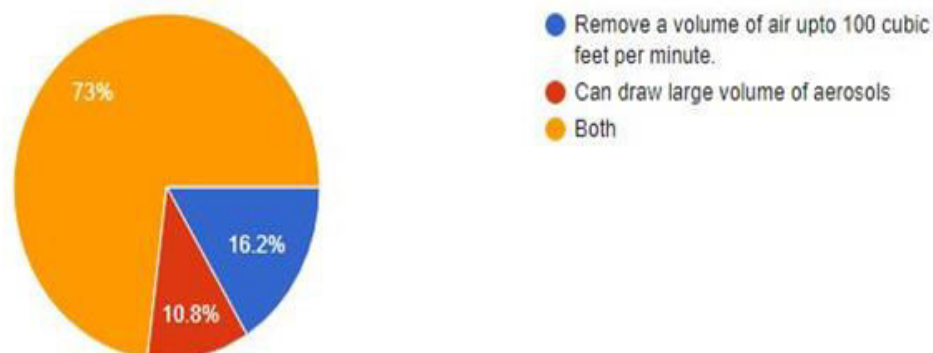


Figure 5:

(5) How often do you use PPE while performing dental procedures

111 responses

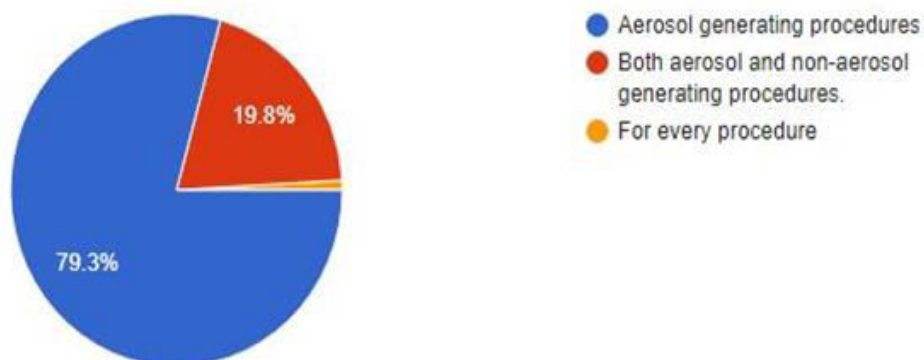


Figure 6:

(6) Do you prefer face shields during examining and while performing dental procedures or a protection eyewear

111 responses

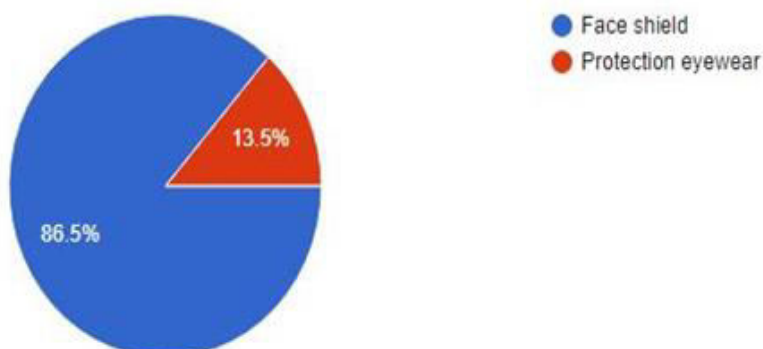


Figure 7:

(7) Do you use double gloves for each patient

111 responses

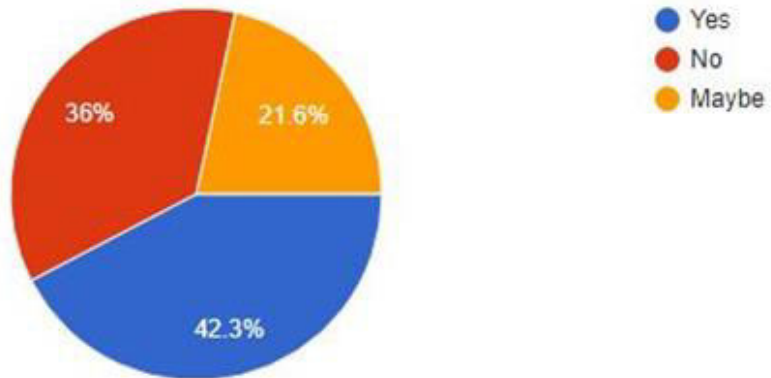


Figure 8:

(8) Do you use pre-procedural rinses for your patients?

110 responses

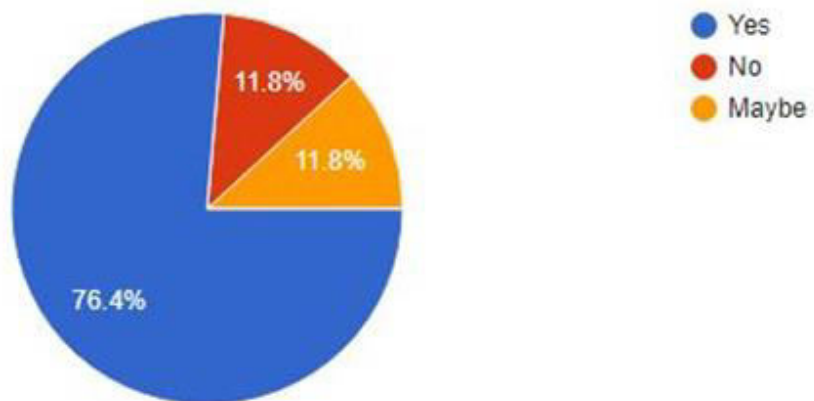


Figure 9:

(9) While examining a suspected COVID patient, how do you sterilise the diagnostics after use

111 responses

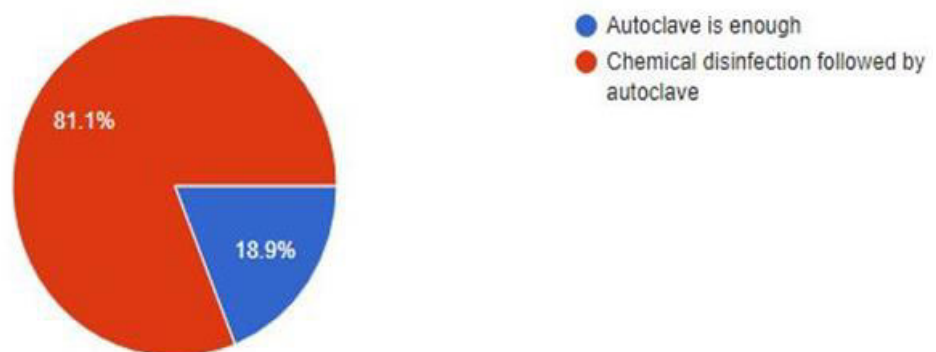


Figure 10:

(10) Do you use the Ultra Violet Steriliser? How effective do you think it is in achieving sterilization
111 responses

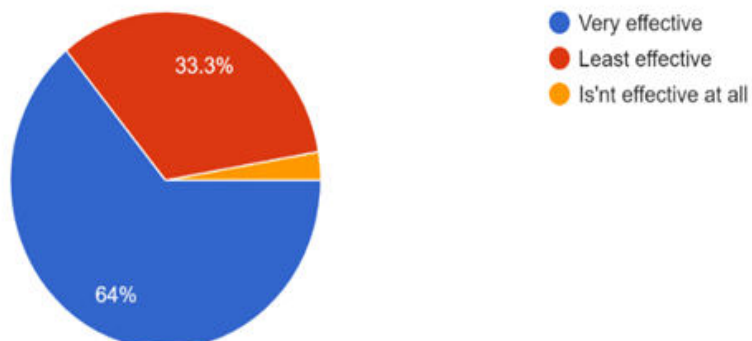


Figure 11:

(11) Do you use the Ultra Violet Steriliser?
111 responses

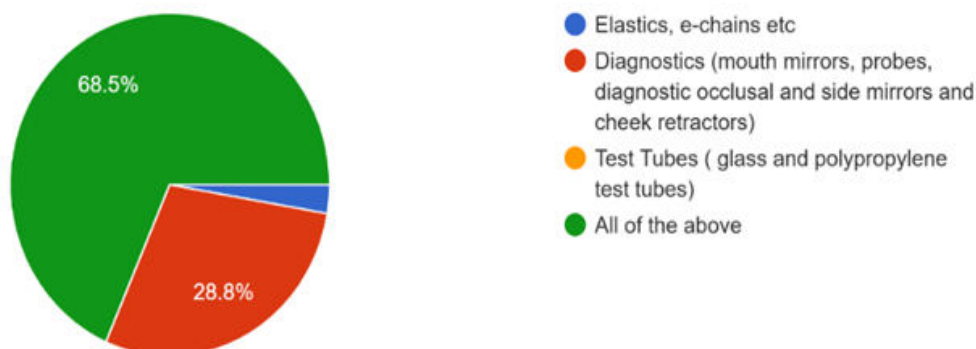


Figure 12:

(12) How do you sterilise the used endodontic files and spreaders
111 responses

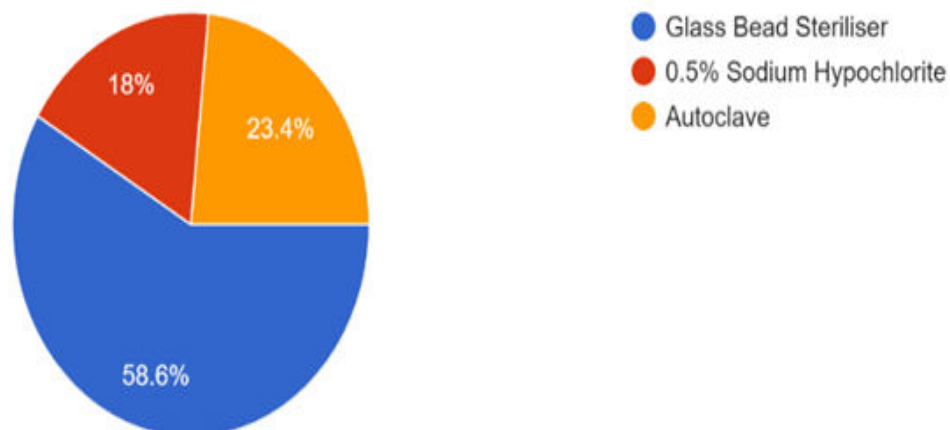


Figure 13:

(13) How effective do you think is chemical disinfection when compared to autoclave

111 responses

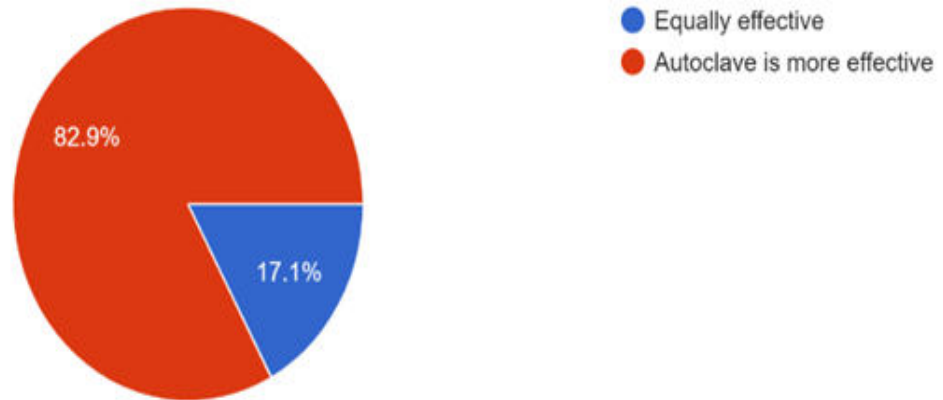


Figure 14:

(14) Do you think limiting the use of ultrasonic scalers and rotary instruments per day will decrease the chance of COVID infection spread

110 responses

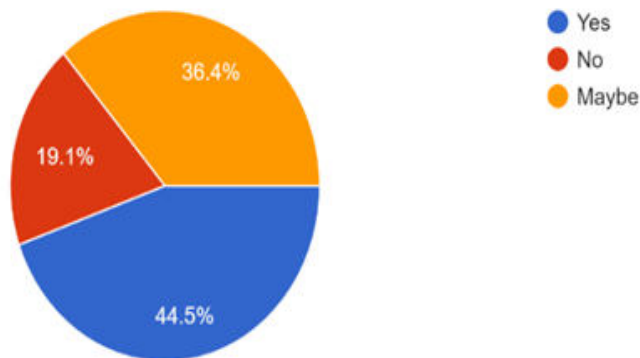


Figure 15:

(15) Do you think use of conventional hand instruments should be promoted to control the air borne infections

111 responses

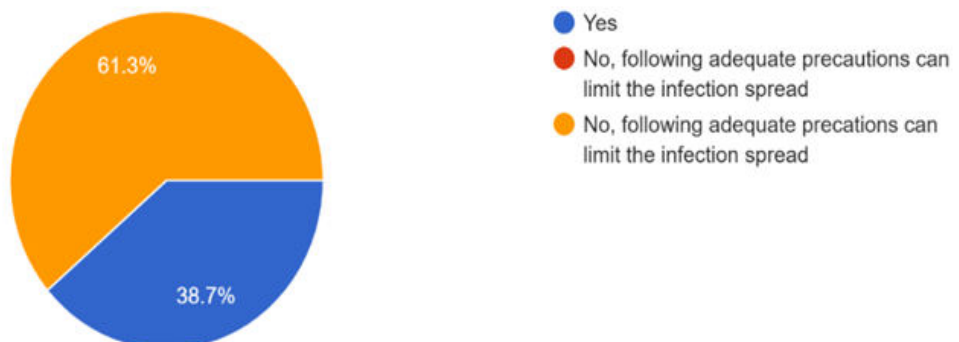
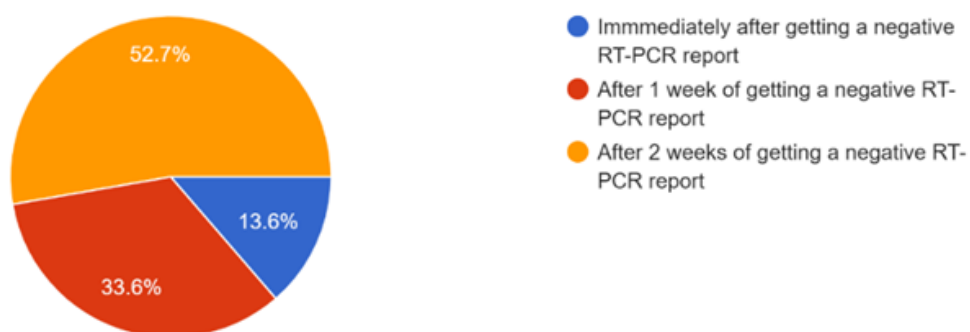


Figure 16:
(16) How much time do you wait to treat a COVID recovered patient

110 responses



DISCUSSION

As instructed by the guideline for the diagnosis and treatment of Novel Coronavirus Infected Pneumonia (5th edition) released by the National Health Commission of the People's Republic of China(2020), it was reported that mouth rinses containing oxidative agents such as 1% hydrogen peroxide or 0.2% povidone iodine should be preferred for limiting Coronavirus infection.² In this study a majority of clinicians felt that a pre-procedural rinse is mandatory for every patient. A study done in 2020 by Peng X et al. quoted that dental professionals should be familiar with how 2019-nCoV is spread, how to identify patients with 2019-nCoV infection and what extra protective measures should be adopted during the practice in order to prevent the transmission of 2019-nCoV.³ According to a study by Bagg J et al. in 2007, clear and unambiguous advice should be provided to the dental team on appropriate equipment, chemicals and environment for cleaning dental instruments.⁴ The results obtained in this present study is similar to the study results conducted by Sachdeva et al. in 2019 to assess the level of knowledge, attitudes and practice regarding sterilization/infection control measures among the undergraduate dental students which showed that a majority of the students were highly concerned regarding the sterilization and infection control procedures.⁵

Human Corona Viruses (HCoV) can persist on surfaces like metal, glass or plastic for up to a couple of days. Therefore, contaminated surfaces that are frequently contacted in healthcare settings are a potential source of coronavirus transmission. Dental practices derived droplets and aerosols from infected patients, which likely contaminate the whole surface in dental offices. The most important concern in dental clinics is the transmission of 2019-nCoV via droplets and aerosol because, despite all of the precautions taken, it is almost impossible to reduce droplet and aerosol production to zero during dental procedures. Dental hand pieces utilize high-speed gas to rotate with running water, which leads to the

generation of a considerable number of droplets and aerosol mixed with patients' saliva and/or blood. Coronaviruses can actively maintain their virulence at room temperature from 2 hours up to 9 days. Their activity at 50% humidity was significantly higher than 30%. Therefore, in the dental environment, it seems that keeping surfaces clean and dry will play a significant role in preventing 2019-nCoV transmission.[12] In the present study, the use of pre-procedural rinse was recommended by 74.8%, which is similar to the guidelines proposed by *Nimbulkar G, et al, 2020* which suggested the use of 1% H₂O₂ or 0.2% Povidone Iodine as a pre-procedural rinse. The current study also shows the use of high-volume evacuator was advocated by 86.5% respondents, also the use of PPE for aerosol generating procedures was recommended by 79.3%. This shows that there is adequate awareness about the various sterilization/disinfection protocols for COVID related precautions that needed to be taken. Although the usage and acceptance of these protocols has showed varied results, this can be attributed to reasons like high cost, availability of these precautionary measures.

CONCLUSION

The basic knowledge and awareness of COVID-19 sterilization protocols among the dental clinicians was found to be adequate. Barrier-protection equipment, including protective eyewear, masks, gloves, caps, face shields and protective outerwear is strongly recommended for all healthcare givers in the clinic/hospital settings during the epidemic period of Covid-19. Dental professionals should be familiar with the mode of spread and what extra-protective measures should be adopted during the practice to prevent cross infection. In many dental practices, the reusable dental instruments are not sterilized adequately, also the infected materials are not disposed of properly, which increase the risk of cross infection. Clear unambiguous advice must be provided to the entire clinic staff regarding

appropriate equipment, chemicals and methods used for proper disinfection of the used dental instruments and devices.

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