



“PRACTICE MODIFICATIONS PRELIMINARY TO PERIODONTAL TREATMENT DURING COVID-19 PANDEMIC BY THE ORAL HEALTH CARE PROVIDERS TO CONTAIN ITS SPREAD: A QUESTIONNAIRE SURVEY.”

Periodontology

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ABSTRACT

Introduction: Oral health care providers should make some serious practice modifications to curb the spread of COVID-19 in a dental setting, especially before periodontal treatment, due to the unique characteristics of dental procedures, a large number of droplets and aerosols are generated. We aimed to evaluate the knowledge, perception, attitude and awareness about the COVID-19 pandemic, practice modifications made by oral health care providers (OHP) before periodontal therapy.

Methods: A 25 Item questionnaire was structured and distributed among oral health care providers. A convenient sampling method was used for data collection (n=251), and the distribution of responses was presented as frequencies and percentages.

Results: 251 participants out of whom 69.7% were 20-30 years, 6.8% of them were above 50 years of age and the male to female ratio 1:1.5, their educational status was BDS 44.6%, MDS 40.6% and Diploma in dental hygiene 14.8%, who mainly were practicing in urban dental setting (66.1%) their total Knowledge score was 6 (Bloom's criteria) and their source of data was WHO guidelines (78%). Personal Protective Equipment, used while performing aerosol-generating procedures for treating periodontal diseases, was disposable type 85% and reusable were only 15%. Audiovisual clips, Pamphlets, and Posters/ Banners were used by 54.2% to educate patients regarding limiting the spread of COVID-19.

Conclusion: There is a need for regular educational interventions and training programs on infection control practices for COVID-19 across all oral healthcare professionals. Efficient and practical strategies are required by OHP to prevent, control, and contain the spread of COVID-19.

KEYWORDS

Aerosols; COVID-19, Periodontal Treatment; Practice modifications; Oral health care provider; Questionnaire survey.

INTRODUCTION:

The World Health Organization announced that the novel coronavirus outbreaks had constituted a public health emergency of international concern.¹

Organizations such as the Centres for Disease Control and Prevention (CDC) and the World Health Organization (WHO) have developed preparedness and prevention checklists to curb the spread of COVID-19 by the public and general healthcare professionals.^{2,3} Respiratory and saliva droplets, direct contact with cases or with contaminated surfaces is how COVID-19 transmits from human to human.⁴ Periodontal procedures that generate aerosols might be one of the airborne transmission modes for this virus, although this transmission route is not fully understood.³

Some of the dental offices around the world have returned to providing routine or not urgent dental care, the limited knowledge and awareness, unavailability of protocols and scanty use of personal protective equipment (PPE) might lower the level of safety of patients, dentists, and dental care workforce which might increase the spread of infection in the community.⁵ Studies have shown that dentistry has a high risk of cross-infection^{6,7} because splatters and aerosols are produced during routine dental treatments, combined with the physical proximity of the patient's face to the practitioners, resulting in an increased risk of transmission.⁸ A recent study by Peng X et al. shows that the stability of SARS-CoV-2 and SARS-CoV-1 in aerosols and on various surfaces and also investigated the same in experimental conditions, where he concluded that airborne transmission of SARS-CoV-2 is practicable since the virus can remain viable and infectious in aerosols for hours.⁹⁻¹⁰ Thus, extreme precautions appear to be necessary before any periodontal therapy.

Although guidelines and different types of equipment to curb the spread of COVID-19 during periodontal therapy is available, as to how

much of it is feasible and practical to use in daily dental practice amid this pandemic is still a question, and how much of it is being followed by the practitioners is scarcely investigated.

Therefore we prepared a structured questionnaire of 25 items to assess the knowledge, attitude, perception, and awareness about COVID-19 infection and practice modifications done before periodontal treatment during COVID-19 pandemic by oral health care providers to contain the spread of COVID-19 in a dental health care setting.

METHODOLOGY:

STUDY DESIGN

A self-designed questionnaire written in the English language was made containing 25 questions. Development and refinement of the questions were made and was divided into **four domains**: The first containing demographic data of the participants [5 questions]; the second regarding their knowledge about a health condition (symptoms/signs related to COVID-19) [9 questions]; the third on the practice modifications, perception, and awareness about personal protective measures and equipment adopted by them after the outbreak of Covid-19 during the treatment of periodontal diseases [8 questions]; the fourth is to assess their attitude towards periodontal treatment during COVID-19 pandemic [3 questions].

Ethical committee approval was obtained from the Institutional Review Board of PMNM Dental College and Hospital before conducting the study.

SAMPLE SIZE CALCULATION

A convenience sample size was determined using the estimates from the parent article & using a single proportion formula as below.

$$n = \frac{1.96^2 p(1-p)(DEFF)}{d^2}$$

We estimated $n = 251$ at 5% confidence limit for $p = 0.05$ and assumed the current knowledge level to be 18%.

METHOD OF COLLECTION OF DATA:

Both registered dentists and dental hygienists were personally mailed the Google documents link through emails and WhatsApp. We had asked them to recruit their colleagues/ Friends practicing to participate in the survey.¹¹

A total awareness score was calculated based on the subject's responses. Each negative response was given a 0 score, and a positive response was given 1, and the total score of the participant was calculated by adding the sum of all responses, which ranged from 0 to 9. Based on the collective sum of scores, subjects are considered to have a high level of knowledge if the percentage score will be (80%–100%; 7–9 score), moderate level (60%–79%; 5–7 scores), and ($\leq 59\%$; 0–5 scores) as low level.

Oral health care workers who are registered Dental hygienists/ Dentists (General or specialist dentists) were included, and those who disagreed to participate in the study and who were not willing to give their consent were excluded from the survey.

Table-1: Comparison of total knowledge score.

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Gender	N		Mean		Std. Deviation	Std. Error Mean	T value		p value of t test	
Male	100		5.91		1.881 .188		-3.486		.001**	
Female	149		6.57		1.104 .090					
Qualification	95% Confidence Interval for Mean									
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum	F value	p value
Diploma	37	5.08	2.178	.358	4.35	5.81	0	8	14.206	.000**
BDS	112	6.52	1.131	.107	6.31	6.73	2	8		
MDS	102	6.43	1.499	.148	6.14	6.73	0	9		

** - Statistically significant

There was a statistically highly significant difference seen for the values between the groups ($p < 0.01$) with higher values in Females, participants with 0-5 years of work experience and who had MDS degree.

Practice Modifications made before periodontal treatment:

About 80% of participants monitored and managed Dental Health Care Providers' health conditions in their health care setting. Since the onset of lockdown, the participants have undertaken preventive measures to limit the spread of COVID-19, in general, as depicted in (Figure-1), and Practice modifications followed to limit the spread of COVID-19 during periodontal treatment are depicted in (Figure-2).

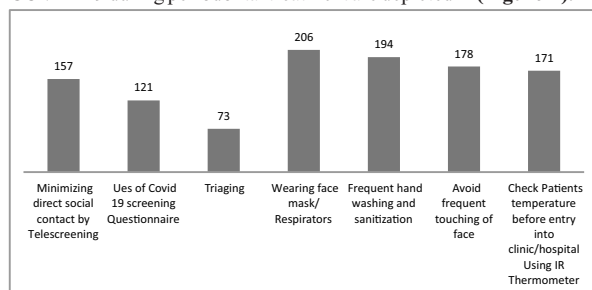


Figure-1: Preventive measures undertaken to limit the spread of COVID-19 in general.

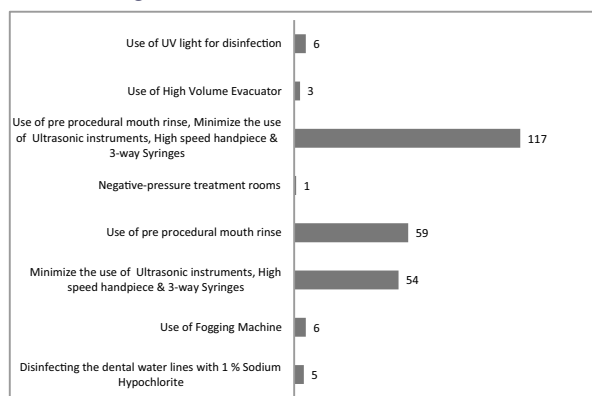


Figure-2: Practice modifications followed to limit the spread of COVID-19 during periodontal treatment.

Statistical analysis:

Data obtained was analysed using SPSS v 26.0 software. Descriptive statistics like frequencies and percentage for categorical data has been depicted, and a comparison of frequencies of categories of variables with groups was made using the chi-square test. For all the statistical tests, $p < 0.05$ was considered statistically significant, keeping α error at 5% β error at 20% and power of the study was 80%.

RESULTS:

Demographic data:

Two hundred fifty-one participants completed the survey out of whom 69.7% were 20-30 years, 6.8% of them were above 50 years of age, and the male to female ratio was 1:1.5, their educational status was BDS 44.6%, MDS 40.6%, and Diploma in dental hygiene 14.8%, who mainly were practicing in an urban dental setting, which was 66.1% when compared to Rural of 33.9% of participants.

Knowledge about COVID-19:

Total Knowledge score for all participants was 6 [66.6%] (Moderate level of knowledge), and their distribution and comparisons are depicted in (Table-1).

Seventy-eight percent of the participant has used WHO guidelines as a source of data regarding infection control and practice modifications required in their regular dental practice. Personal Protective Equipment, which was used while performing aerosol-generating procedures for treating periodontal diseases, was disposable type about 80% and reusable were only about 20%. The agent used for surface disinfection before and after periodontal treatment was 60-90% Alcohol-based disinfectant by 53% of participants and only 16.7% of them used 1% Sodium hypochlorite for the same. The mode used by the OHP to educate patients regarding limiting the spread of COVID-19 was **audi-visual clips, pamphlets, posters and banners**. About 65% of participants did not take prophylactic medication or any immunity boosters, while the rest of 35% of them have taken either vitamin, hydroxychloroquine (HCQ), homeopathic, or ayurvedic immunity boosters.

Attitude towards periodontal treatment during COVID-19 Pandemic:

About 70% of the participants follow CDC recommendations and provide periodontal treatment during COVID-19, and 70% of participants think COVID-19 suspected/positive patients are not eligible for periodontal treatment. Sixteen percent of the OHP think that we should avoid aerosol-producing procedures entirely, and 4% of them are afraid of COVID-19 infection, so they do not want to treat any patients until this pandemic is over.

DISCUSSION:

A potential mode of transmission of COVID-19 is by saliva. The oral hygiene Providers in dental practice are exposed to tremendous risk of COVID-19 infection due to face-to-face communication and exposure to saliva, blood, and other body fluids. Following these strict and effective infection control protocols may be difficult due to various issues with supply and demand of the essentials and high cost of equipment such as HEPA filters high volume saliva ejectors and creating an isolated or negatively pressured room for dental treatment. Despite all these problems the oral health care provider faces, they are managing to give the best dental care with varied interventions to protect the health and safety of patients and contain the exponential spread of COVID-19 in the population. The mean total Knowledge score showed that female OHP was more knowledgeable when compared to their male counterparts (Table-1). These results could be because most of the Indian students pursuing dental education are female.¹²

A comparison of total knowledge scores among practitioners with

varying qualifications suggested that the dentist owning the MDS degree had more knowledge than those who owned BDS degrees and least among Dental hygienists. These results could be because of a low number of participants with a diploma in Dental hygiene in the survey and maybe because dentists with masters qualification may undergo extensive infection control training and have more chances for professional development. These results are in agreement with a study by Kamte SK et al.¹³

The total knowledge score of 66.6% indicating a moderate level of knowledge which are in contrary with a study by Guptha et al.¹⁴ who found 38.2% of knowledge among Indian dentist on Zika virus. Although in our current study we found a moderate level of knowledge regarding COVID-19 and 45% of them were aware of CDC and WHO guidelines^{2,3} for practice modifications for dental treatment during the COVID-19 pandemic, only 22% of them practiced Tele-screening, use of COVID-19 screening questionnaire, Triage, wearing facemask/respirator, frequent hand washing, sanitization and checking patients temperature before entering into Dental clinic/ Hospital using IR thermometer. These results maybe because of the low Supply – Demand ratio and disruption in the global supply chain of the personal protective equipment (PPE) or because these measures are not cost-effective to be implemented regularly by the oral health care provider. Therefore WHO has released recommendations for optimal use of available PPE by 1) Minimizing the need for PPE, 2) Ensure PPE use is rational and appropriate, 3) Coordinate PPE supply chain management mechanisms.¹⁵

Measures used to educate patients on limiting the spread of COVID-19 in a dental setting has to be emphasized. Oral health care providers of about 35% did not use any prophylactic medications or any immunity boosters before reopening of dental practice after the lockdown situation created by the COVID-19 pandemic in the nation. These conclusions maybe were because of their unknown efficiency against the COVID-19 virus, and more longitudinal studies are required for it to be accepted universally.

We found that only about 2% of the participants use 1% of sodium hypochlorite for disinfection of water lines, about 2% of them use fogging machine for disinfecting the treatment area before periodontal treatment involving aerosol procedure. Only 0.3% of them have access to negative pressure rooms, about 1% of them use high volume evacuator, and about 2% of them use UV light for disinfecting the treatment area, but 70% of them use pre-procedural mouth rinse and are minimizing the use of ultrasonic instruments, high-speed handpieces, and 3-way syringes during the periodontal treatment procedure. This low utilization of these types of equipment to curb the spread of COVID-19 may be because of their high-cost, non-practical, and uneconomic nature of these equipment types among regular OHP in India.

We assessed the OHP's perception and found that about 16% of them think that aerosol procedure should be strictly avoided, about 10% of them think that it is not required to follow any practice modifications and recommendations given by CDC and WHO before aerosol producing periodontal treatment.

To the best of our knowledge, our survey is the first to evaluate OHP's practice modifications before periodontal treatment during this COVID-19 pandemic and their attitude towards the same.

CONCLUSION:

Oral health care providers should appropriately use social media to spread awareness among people, and in their clinical practice, they should screen, isolate and refer the potential cases having the symptoms of COVID-19. It is also advised to follow the CDC and WHO guidelines in their practice, sensitize their staff, and educate the patients on how to limit the spread of COVID-19 during this pandemic.

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