Prosthodontic Attitudes and Practices among Dentists during the First Wave of COVID-19 Era

Abstract
Context: Coronavirus disease (COVID-19) is a highly infectious disease that poses a threat in dental practice especially in prosthetic clinics due to the peculiar nature of prosthodontic procedures. Aims: The aim of this study was to determine the attitude and practices in prosthodontics during COVID-19 period. Settings and Design: An online cross-sectional survey was done among dentists practicing prosthodontics across Nigeria. Materials and Methods: The survey was carried out by sending validated structured self-administered questionnaire to dentists on different social and specialty platforms. The questionnaire was designed into four segments namely socio-demographics, attitude, practice, and preparedness of dental staff towards COVID-19. Statistical Analysis Used: Data analysis was done using SPSS software program, version 25.0. Statistical significance was established at \( P < 0.05 \). Results: A total of 123 participants were seen with mean age of 45.20 ± 10.80 years. The specialists (48.0%) constituted the largest group, and the majority of participants were from the southwest (74.8%). Only 27.6% were very eager to perform dental procedures. Majority (64.2%) of the treatment was done by consultation via telephone calls, the use of telephone calls was not associated with age nor gender \( (P = 0.903, 0.611, \text{respectively}) \). A total of 31.7% attended to emergency cases occasionally. Only 13.4% performed prosthodontic treatment and this procedure was done in line with recommended guidelines to control and prevent the spread of COVID-19. Conclusion: The eagerness to perform dental procedures was low and majority of treatment was done by consultation via telephone calls. However, prosthodontic procedure was done by a few of the dentists according to the recommended guidelines for prevention and control.

Keywords: COVID-19, practice, prosthodontics

Introduction
Coronavirus disease-2019 (COVID-19) is a highly infectious respiratory disease that has been declared a pandemic by the World Health Organization (WHO).\(^1\) It is caused by a novel coronavirus and has clinical symptoms such as fever, dry cough, fatigue, myalgia, dyspnea, and recently symptoms such as loss of smell and taste have been added. Infections have risen to millions globally with number of deaths increasing by the day. The contagious nature of this virus has made many medical institutions to cancel elective procedures.\(^1\)

In dentistry, the patient and dentist are highly at risk because of the generation of aerosol from hand pieces and ultrasonic instrument used during dental procedures\(^2\) coupled with the nature of close contact between dentist and patient during dental treatment.\(^3\) Post-infection period are challenging to dentist because of relatively prolonged incubation period (might be up to 14 days with no symptoms, mild cases with little or no symptoms) that makes it difficult for dental staff to recognize or detect existence of infection. Patient with COVID-19 infections with no symptoms are particularly of significant threat to the dentist and other staff.\(^4\)

The Centre for Disease Control and Prevention (CDC), American Dental Association (ADA) and WHO have recommended guidelines to prevent the spread of this disease. These include the use of personal protective equipment (PPE), hand wash or sanitizer, rubber dam isolation, anti-retraction hand piece, taking detailed patient evaluation, ensuring patient use of mouth rinses before dental procedures and disinfection of the clinic.\(^5-7\)

It is necessary that dentist (especially the prosthodontist, due to the nature of the aerosol-generating procedures [AGP]) have a high level of awareness and show this in their practice to control and manage the spread of the disease. The aim of this study therefore is

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to determine the dental practices in prosthetic clinics during the first wave of COVID-19 pandemic period.

**Materials and Methods**

This was an online cross-sectional survey involving dentists in prosthodontics practice either in the clinics or laboratories across Southern part of Nigeria. The study traversed levels of designation and different clinical/laboratory settings. The survey was carried out by sending validated structured self-administered questionnaire[8] to all dentists on different dental social and speciality platforms. The questionnaire was designed into four segments namely socio-demographics, attitude, practice, and preparedness of dentists towards COVID-19. The questionnaire was worded in English language. The questionnaire contained a brief description of the study which was followed by 10 questions. The questions assessed the level of attitude and practice of dental procedures during COVID-19 pandemic period and preparedness in compliance of preventive measures in handling suspected cases. Participation was voluntary and an informed consent was made by participants on survey form. The participants were advised to return the completed questionnaire through the online platform to the authors. Regular reminders were sent every week on the dental platforms. The study was for a period of 4 weeks after which responses were collated for analysis.

Data were retrieved from the SurveyMonkey online platform in Excel spread sheet and was subjected to analysis using SPSS software program, version 25.0. Descriptive analysis was done for all discrete variables and a test of association was carried out using Pearson’s chi-square test. Statistical significance was established at \( P \leq 0.05 \).

**Results**

A total of 123 participants were enlisted in this study after completion of an online questionnaire survey forms. The mean age was 45.20 ± 10.80 with male 60.2% predominance [Table 1]. Most of the participants in the study were consultants/specialists (48.0%) working in tertiary and federal hospitals. The participants were drawn from the three geo-political zones of Nigeria: South-west (74.8%), South-east (15.4%), and South-south (9.8%) [Table 1].

The proportion of participants who responded “very often” to question on continued treatment under routine infection was 27.6%.

The proportion of participants who occasionally attended to emergency patients during pandemic period was 31.7% [Table 2]. Approximately 64.2% of participants engaged in telephone consultation as a treatment option during the pandemic period [Figure 1].

The proportion of participants who reported carrying out prosthodontics laboratory procedures “very often” were 43.9% and “fairly done” were 14.6%.

Most of the prosthodontics procedure done was fabrication of removable prosthesis (58.6%). All patients treated were very often treated as suspected COVID-19 patients by majority (61.0%) of participants.

Among the study participants, 3.7% of the population reported that they saw confirmed cases although method of confirmation was not stated.

Only 13.4% performed prosthodontic clinical treatment and this procedure was reported to be done in line with recommended guidelines to control and prevent the spread of COVID-19.

| Table 1: Sociodemographic characteristic of participants |
|---------------------------------------------------------|
| **Variable** | **Frequency (n = 123)** | **Percentage** |
| Age group (years) | | |
| 21–30 | 19 | 15.4 |
| 31–40 | 28 | 22.8 |
| 41–50 | 35 | 28.5 |
| 51–60 | 35 | 28.5 |
| 61–70 | 6 | 4.9 |
| Mean ± SD | 45.20 ± 10.8 |
| Gender | | |
| Male | 74 | 60.2 |
| Female | 49 | 39.8 |
| Designation | | |
| House officer | 7 | 5.7 |
| Dental officer | 23 | 18.7 |
| Resident | 18 | 14.6 |
| Consultant | 59 | 48.0 |
| General dental practice | 16 | 13.0 |
| Type of practice | | |
| Private | 14 | 11.4 |
| State hospital | 39 | 31.7 |
| Tertiary/federal hospital | 70 | 56.9 |
| Zone of practice | | |
| South-west | 92 | 74.8 |
| South-east | 19 | 15.4 |
| South-south | 12 | 9.8 |

| Table 2: Responses of participants to procedures and cases |
|-------------------------------------------------------------|
| **Procedure** | **Very often** | **Fairly often** | **Occasional** | **Hardly ever** | **Never** |
| Perform dental laboratory procedure | 54 (43.9) | 18 (14.6) | 33 (26.8) | 9 (7.3) | 9 (7.3) |
| Attend to emergency patients during pandemic period | 11 (8.9) | 23 (18.7) | 39 (31.7) | 21 (17.1) | 29 (23.6) |
| Do prosthodontics clinical procedure | 16 (13.4) | 23 (18.7) | 36 (29.3) | 18 (14.6) | 30 (24.4) |
| Treat all cases as suspected cases | 75 (61.0) | 20 (16.3) | 9 (7.3) | 9 (7.3) | 10 (7.3) |
| Refer all confirmed cases to appropriate institution/unit | 60 (48.8) | 13 (10.6) | 6 (4.9) | 12 (9.8) | 32 (26.0) |
| Recorded any confirmed cases in your clinic/center | 0 (0.0) | 0 (0.0) | 4 (3.7) | 0 | 119 (96.7) |
Our findings on infection control practices were similar to the findings in the prosthodontic clinics of some private dental centers in India and a contrast to the government hospitals in Riyadh, Saudi Arabia. However, our study encompassed private, government state and teaching hospitals across the southern part of Nigeria which showed more variability. The result of our study showed that the Consultants/Specialists responded more towards activities in the clinic when compared to that of the registrars/dental officers. This might be due to low number of participants at some level of designation such as the house officers, senior registrars, principal dental officers and senior dental officers with less coverage of participants in both South-East and South-South geo-political zones. This calls for future studies to be done to obtain a larger sample of the dental workforce.

Prosthodontic work was reduced during pandemic period resulting in 29.3% of dental practitioner performing prosthodontics work occasionally, whereas 24.4% abstained from performing prosthodontic procedure. [15]

However, due to restriction in movement during the pandemic period, the number of participants attending to patients was reduced (34.1%) and this is similar to the finding in China where the demand for urgent dental treatment decreased by 38%. [17] Furthermore, the use of telephone in the prosthetic clinic proved to be essential in this pandemic period and a large proportion (64.2%) of the participants made use of this service, which is similar to other studies [18,19] that also reported the use of telemedicine and WhatsApp in dental practice. In suspected or confirmed COVID-19 cases, dental emergencies are referred to as urgent dental care services as seen in other studies. [20,21,22]

Universal precautions in infection control should be implemented in all dental practices including prosthodontic clinics. This is reinforced in the recommendations considered for reopening dental practices globally. [23] The document contains five domains: (1) practice preparation and patient considerations, (2) PPE for dental practice personnel, (3) management of the clinical room, (4) dental procedures, and (5) postoperative cleaning/disinfection/waste management.

In the practice preparation and patient considerations, the dental practice must be triaged into healthy group, shielded group, high-risk group, confirmed and suspected case groups. [24] All patients must wear facemasks, wash hands with soap/use hand sanitizer, and undergo temperature check at the clinic entrance. Surgery procedures should be timed and all equipment should be sterilized. All work surfaces should be disinfected. Staff routines (don and doffing of PPE) and appointment should also be scheduled. PPE for dental practice personnel is essential to prevent cross transmission and act as a barrier from exposures to potentially infectious diseases. PPE should include gloves, face masks (N95/surgical), face shield, protective clothing, and enclosed footwear. Treatment rooms in the clinic must be well ventilated with windows and doors open to reduce aerosol exposure. Redundant materials, equipment, and instruments must be removed to prevent clutters, and the floors of surgery cleaned after each procedure. In cross infection control, when using and transferring dental materials between prosthetic clinics and dental laboratories, the CDC recommended that dental practitioners disinfect all impressions, dental casts, metal framework, bite registrations or wax before sending them to the dental laboratory. [9,25]

Some limitations of this study include the number and distribution of participants not representing the whole Nation (Nigeria), and thus the results may lack external validity.
Also, the questionnaire was not specific on the clinical work and laboratory work which undermined the response to the questions asked, likewise information on how confirmed cases was determined by participants was not stated. More studies are needed to elaborate these shortcomings and to improve the recommendations to all stakeholders.

Conclusion
Most dentists were not very eager to perform dental procedures in prosthetic clinic during this pandemic period. Majority of treatment was by consultation via telephone calls and prostodontic procedures were done with caution observing guidelines and precautionary measures laid out by the National Centre for Diseases Control and other Health authorities.

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Conflicts of interest
There are no conflicts of interest.

References
1. Guo Y-R, Cao Q-D, Hong Z-S, Tan Y-Y, Chen S-D, Jin H-J, et al. The origin, transmission, and clinical therapies on coronavirus disease 2019 (COVID-19) outbreak: An update on the status. Mil Med Res 2020;7:1-10.
2. Kohn WG, Collins AS, Cleveland JL, Harte JA, Eklund KJ, Malvitz DM. Guidelines for infection control in dental health-care settings-2003. MMWR Recomm Rep 2003;52:1-61.
3. Zemouri C, de Soet H, Crielaard W, Laheij A. A scoping review on bio-aerosols in healthcare and the dental environment. PLoS One 2017;12:e0178007.
4. Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, et al. Early transmission dynamics in Wuhan, China of novel coronavirus–infected pneumonia. N Eng J Med 2020;382:1199-1207.
5. The World Health Organization (WHO). Clinical Management of Severe Acute Respiratory Infection When Novel Coronavirus (nCoV) Infection is Suspected: Interim Guidance; 2020. Available from: https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-(ncov)-infection-is-suspected. [Last accessed on 2020 Mar 13].
6. Centres for Disease Control and Prevention (CDC). CDC Developing Guidance Regarding Responding to COVID-19 in Dental Settings. Division of Oral Health, National Center for Chronic Disease Prevention and Health Promotion; 2020. Available from: https://www.cdc.gov/oralhealth/infectioncontrol/statement-COVID. [Last accessed on 2020 Mar 11].
7. The American Dental Association (ADA). Coronavirus Frequently Asked Questions; 2020. Available from: https://success.ada.org/en/practice-management/patients/coronavirus-frequently-asked-questions. [Last accessed on 2020 Mar 16].
8. World Health Organization. A Guide to Developing Knowledge, Attitude, and Practice Surveys. Geneva: World Health Organization; 2008.
9. 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;12:9.
10. Rothe C, Schunk M, Sothmann P, Bretzel G, Frosch G, Wallrauch C, et al. Transmission of 2019-novel coronavirus (2019-ncov) patients from an asymptomatic contact in Germany. N Engl J Med 2020;382:970-1.
11. Wax RS, Christian MD. Practical recommendations for critical care and anaesthesiology teams caring for novel coronavirus (2019-nCoV) patients. Can J Anesth 2020;67:568-76.
12. Sivakumar I, Arunachalam KS, Solomon E. Occupational health hazards in a prosthodontic practice: Review of risk factors and management strategies. J Adv Prosthodont 2012;4:259-65.
13. Vázquez-Rodriguez I, Estany-Gestal A, Seoane-Romero J, Mora MJ, Varela-Centelles P, Santana-Mora U. Quality of cross-infection control in dental laboratories: A critical systematic review. Int J Qual Health Care 2018;30:496-507.
14. Osman T. Epidemiology of sharp instruments injuries at a dental school in Sudan. Int J Infect Control 2014;10:10.3396.
15. Deogade SC, Suresan V, Galav A, Rathod J, Mantri SS, Patil SM. Awareness, knowledge, and attitude of dental students toward infection control in prosthodontic clinic of a dental school in India. Niger J Clin Pract 2018;21:553-9.
16. Alshiddi IF. Attitude and awareness of dental students and interns toward infection control measures in prosthodontic clinics. J Int Oral Health 2015;7:10-5.
17. Guo H, Zhou Y, Liu X, Tan J. The impact of the COVID-19 epidemic on the utilization of emergency dental services. J Dent Sci 2020;15:564-7.
18. Nardo B, Cannistrà M, Diaco V, Naso A, Novello M, Zullo A, et al. Optimizing patient surgical management using WhatsApp application in the Italian healthcare system. Telemed J e-Health 2016;22:718-25.
19. Petruzzii M, De Benedittis M. WhatsApp: A telemedicine platform for facilitating remote oral medicine consultation and improving clinical examinations. Oral Surg Oral Med Oral Pathol Oral Radiol 2016;121:248-54.
20. Ather A, Patel B, Ruparel NB, Diogenes A, Hargreaves KM. Coronavirus disease 19 (COVID-19): Implications for clinical dental care. J Endodont 2020;46:584-95.
21. Li RWK, Leung KWC, Sun FCS, Samaranayake LP. Severe acute respiratory syndrome (SARS) and the GDP. Part II: Implications for GDPs. Br Dent J 2004;197:130-4.
22. Marui VC, Souto ML, Rovai ES, Romito GA, Chambrone L, Pannuti CM. Efficacy of preprocedural mouth rinses in the reduction of microorganisms in aerosol: A systematic review. J Am Dent Assoc 2019;150:1015-26.
23. Global Evidence Ecosystem for Oral Health (GEEOH); 2020. Available from: https://mailchi.mp/692fcf632a1/recommendations-for-the-re-opening-of-dental-services?e=a661da0a3c. [Last accessed on].
24. Goswami M, Chawla S. A comparative compilation of triage recommendations in dentistry during the COVID-19 pandemic. J Oral Biol Craniofac Res 2020;10:374-84.
25. Guidelines for Infection Control in Dental Health-Care Settings 2003. Centres for Disease Control and Prevention; 2003. Available from: https://pubmed.ncbi.nlm.nih.gov/12836624/. [Last accessed on 2020 Mar 10].