

Impact of COVID-19 Pandemic Lockdown on Oral Hygiene Practices and Willingness to utilize Dental Services among Patient Attendees of a Primary Oral Health Care Clinic in Ibadan, Nigeria

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Abstract

Objective: To assess the impact of the COVID-19 pandemic lockdown on oral hygiene practices and willingness to utilize dental care services among patients who attended a Primary Oral Health Care Clinic in Ibadan, Nigeria.

Materials and Methods: A cross-sectional study was conducted among 105 dental patients who had attended the Primary Oral Health Care Centre, Idikan, Ibadan, between July 2019 and March 2020. Data were obtained on the effect of COVID-19 pandemic lockdown on oral hygiene practices and willingness to utilise dental care services during the lockdown was obtained using semi structured questions. The questionnaire was administered through mobile telephone interviews by trained dentists. Data was analysed with SPSS version 25.

Results: The mean age of the participants was 38.2 (± 19.4) years, and 60 (57.1%) were females. During the COVID-19 pandemic lockdown, 19 (18.1%) of the participants reported a change in their oral hygiene habits, out of which 15 (14.3%) increased the frequency and duration of tooth cleaning while it reduced for 4 (3.8%) participants. Twenty-eight (26.7%) of the participants would not have considered visiting the dental clinic for routine check-ups during the period. Fear of contracting COVID-19 infection was the main reason for the unwillingness to utilize dental services for: routine check-up (15.7%) and oral prophylaxis (8.6%). There was no significant association between sociodemographic characteristics of the participants and change in oral health practices during the COVID-19 pandemic lockdown ($p > 0.005$).

Conclusion: The impact of the COVID-19 pandemic was minimal on the oral hygiene practices of the study participants, with many having no change in their oral hygiene practices. The change in oral hygiene practices was in terms of frequency and duration of teeth cleaning. While some had a positive change, few others had negative changes.

Keywords: COVID – 19, Dental services, Oral health, Oral hygiene, Pandemic

Introduction

The novel COVID-19 disease was reported to have started in China, and the origin was traced to Wuhan city¹⁻³. The disease is caused by positive, single-stranded, enveloped RNA viruses that belong to the

Coronaviridae family^{1,3,4}. The disease has spread rapidly in multiple communities globally, and the number of infected persons increased over time^{4,5}. More than 103.9 million cases of COVID-19 have been confirmed, and over 2.2 million individuals have died from this pandemic disease⁶.

The transmission of the disease has been highly postulated to be through respiratory droplets and direct contact². The rapid spread of the disease led to nationwide lockdowns in order to reduce the spread of the COVID-19 pandemic⁷. During the lockdown, several economic activities were shut down, and travel restrictions were also placed⁷.

In Brazil, 44.2% of the respondents would only opt for dental treatments during the country's lockdown period if it were an emergency⁸. However, utilization of emergency dental services, by the populace has reduced in many countries including China⁹. Patients are likely to postpone their dental care because of the economic effects of the pandemic, and the associated underemployment and unemployment experienced¹⁰. The changing dental care-seeking behaviour of individuals that may continue during the COVID-19 pandemic coupled with the fact that dental procedures are risk factors for contagion require primary prevention of oral diseases. It is therefore important to increase activities geared at promoting oral health among the populace¹⁰. In order to plan effectively for the aforementioned activities, there is a need for baseline information on current self-oral care of individuals as it is uncertain how COVID-19 pandemic has affected the self-oral care of individuals globally. To the best of the authors' knowledge limited studies have been conducted globally, and none had been carried out in Africa to assess the extent to which the COVID-19 pandemic has affected the self-oral care of dental patients.

Therefore, there is a need to investigate the impact of the COVID-19 pandemic on oral hygiene practices and willingness to consult the dentist during the pandemic, since this might have a long-term effect on the oral health of the populace. Findings from this study will be used in planning appropriate oral health promotion programmes during the pandemic and other similar situations, especially now that countries are faced with the increasing number of infected cases because of the second wave. This research will also provide information that will inform the necessary steps and policies to bridge the gap caused by COVID-19 concerning preventive self-oral care of patients and dental care treatment. This study assessed the impact of the COVID-19 pandemic on the oral hygiene practices and willingness to utilize dental care services of patient attendees of a Primary Oral Health Care Clinic in Ibadan, Nigeria.

Methods

This pilot study was cross-sectional in design conducted among dental patients who attended the Primary Oral Health Care Clinic (POHCC), Idikan, Ibadan, Nigeria. The study population comprised

patients and parents of paediatric patients who attended the POHCC, over a period of nine months (July 2019 – March 2020). Patients and parents of paediatric patients who received dental treatments at the POHCC, Idikan during the study period and consented to participate in the study were recruited for this pilot survey. Patients who did not have any dental procedure done and those whose phone numbers could not be reached after three attempts each on three different days were excluded from the study. Data was collected using semi-structured interviewer-administered questionnaires. The questionnaire assessed information on the patients' biodata (age, gender, marital status for adults, occupation/parent's occupation), last dental visit, reasons for the dental visit and oral hygiene practices adapted from the World Health Organization questionnaire for oral health¹¹. In addition, it also assessed questions on willingness to seek dental care during the COVID-19 lockdown for: routine dental check-up, emergency treatment for pain and professional oral prophylaxis.

The questionnaire was translated into the Yoruba language from the English language because of respondents who did not understand English. The translation was done by a dentist versed in both Yoruba and English language. It was also back translated to English by a health care professional who had no knowledge of the development of the questionnaire and had also not seen the original version before. The back-translated questionnaire was compared to the original English version to determine the conceptual equivalence, and no difference was found between the two questionnaires. The face and content validity of the questionnaire was evaluated by discussing with two dentists and during the pre-test among patients. Pre-testing of the questionnaire was conducted among 11 patients who attended the POHCC, Idikan, in March 2019. Each patient was asked about the contents of the questionnaire through an interview on the telephone, and appropriate adjustments were made to the questionnaire based on the interaction with them.

The final version of the questionnaires was interviewer-administered to the study participants via phone calls. Participants were reached through the telephone contacts they provided during registration at the POHCC. During the telephone survey, the dentist was introduced, and the purpose of the study was explained in detail to each participant. Questions were entertained, and answers were provided. Thereafter, verbal consent was sought, following which the questions from the

questionnaires were read to them. Responses to the questions were documented in the questionnaire of each study participant. The biodata of participants that were retrieved from the patients' records was confirmed during the interview.

Ethical approval was obtained from the Institutional Review Board (IRB) of the University of Ibadan/University College Hospital, Ibadan. Anonymity and confidentiality of the participants were ensured by not including the names of the patients throughout the report writing process. The data obtained were pre-coded and then analysed using the Statistical Package for the Social Sciences (SPSS) version 25 software. Descriptive statistics of mean and standard deviation were used to summarize numeric data. Frequency and proportion

were used to summarize categorical data, and output was represented using graphs and tables. Association between categorical variables was conducted using Chi-square statistics, and p-value was set at < 5%.

Results

A total of 105 participants were recruited for the study. The mean age was 38.2 (\pm 19.4) years. Most of the study participants, 60 (57.1%), were females. Fifty-two (49.5%) of the participants belonged to the unskilled occupational class, and the majority, 63 (60.0%), were married. There was an almost equal number of Christians and Muslims, 52 (49.5%) and 53 (50.5%) participants, respectively. Most of the participants (93, 88.6%) belonged to the Yoruba tribe (**Table 1**).

Table 1: Sociodemographic Characteristics of the Patients

Variable	Number	Percentage (%)
Age(years)		
<16	14	13.3
17- 34	32	30.5
35- 44	23	21.9
45-59	18	17.1
\geq 60	18	17.1
Total	105	100.0
Gender		
Male	45	42.9
Female	60	57.1
Total	105	100.0
Occupation		
Skilled	14	13.3
Unskilled	52	49.5
Dependents	39	37.1
Total	105	100.0
Highest level of education		
Tertiary	34	32.4
Secondary	37	35.2
Primary	23	21.9
None	11	10.5
Total	105	100.0
Marital status		
Single	36	34.3
Married	63	60.0
Widowed	6	5.7
Total	105	100.0

Religion		
Christianity	52	49.5
Islam	53	50.5
Total	105	100.0
Tribe		
Yoruba	93	88.6
Edo	2	1.9
Igbo	10	9.5
Total	105	100.0

A total of 77 (73.3%) participants had never visited a dentist prior to their presentation at the dental clinic. The majority of the participants, 69 (65.7%), had tooth extraction as the only treatment received at the

dental clinic. Other treatments received at the dental clinic by participants included scaling and polishing, while others had a combination of treatments done (**Table 2**).

Table 2: Past Dental History and Treatment Received among the Patients

Variable	Number	Percentage
Previous dental consultation		
Yes	28	26.7
No	77	73.3
Total	105	100.0
Treatment received		
Tooth extraction only	69	65.7
Tooth extraction and ART	2	1.9
Scaling and polishing only	21	20.0
Scaling and polishing and deep curettage	2	1.9
Scaling and polishing and tooth extraction	10	9.5
Scaling and polishing, deep curettage and tooth extraction	1	1.0
Total	105	100.0

Concerning oral hygiene practices during the COVID-19 lockdown, 4 (3.8%) of the participants forgot to clean their teeth during the lockdown (**Table 3**). Slightly more than half 54 (51.4%) of the participants

cleaned their teeth before breakfast only, 37 (35.2%) cleaned their teeth before breakfast and after dinner, and 6 (5.7%) cleaned their teeth after breakfast and after dinner (**Fig. 1**).

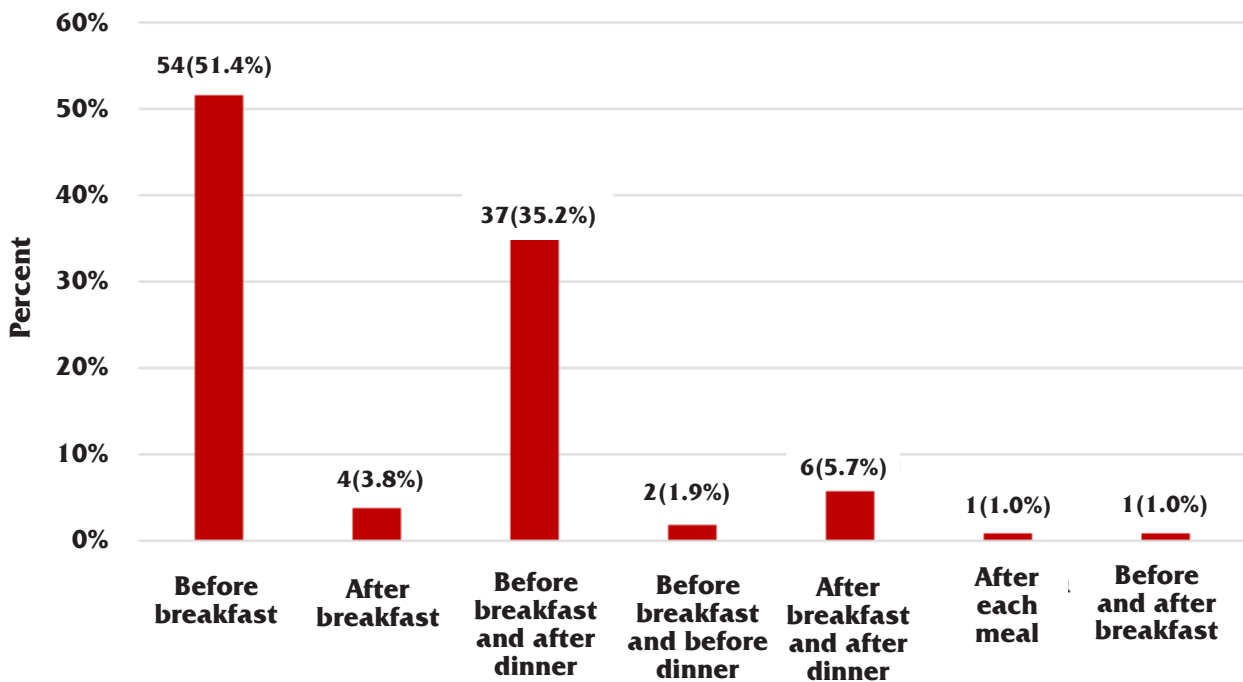


Fig. 1: Timing of Teeth Cleaning among the Participants

A total of 98 (93.3%) participants cleaned their teeth with toothbrushes during the lockdown, while only one participant (1.0%) used chewing stick and six (5.7%) combined chewing stick and toothbrush for teeth cleaning during the lockdown (Table 3). Among

the 105 participants, 47 (44.8%) used the soft-bristled toothbrush type while medium and hard types were used by 44 (41.9%) and 13 (12.4%) participants, respectively (Table 3).

Table 3: Oral Hygiene Practices during COVID-19 Lockdown

Variables	Number	%
Skipping of teeth cleaning n = 105		
Yes	4	3.8
No	101	96.2
Teeth cleaning aid n = 105		
Chewing stick	1	1.0
Toothbrush	98	93.3
Chewing stick and toothbrush	6	5.7
Toothbrush type used n = 105		
Soft	47	44.8
Medium	44	41.9
Hard	13	12.4
Not known	1	1.0
Duration of tooth cleaning n = 105		
< 1 minute	2	1.9
1 minute	4	3.8
2 minutes	12	11.4
≥ 3 minutes	76	72.4
Do not know	11	10.5

Change in oral hygiene habit n = 105

Same	86	81.9
It changed	19	18.1

Type of oral hygiene habit that was changed n = 19

Increased frequency/ duration of teeth cleaning	15	14.3
Teeth cleaning became less frequent	4	3.8

Likelihood of consulting the dentists if contacted by dental clinic personnel n = 105

Yes	99	94.3
No	5	4.8
I don't know	1	1.0

Appreciation of phone interview n = 105

Appreciated	104	99.0
A waste of time	1	1.0

Only 94 participants could recall the amount of time spent while cleaning their teeth during the lockdown: 76 (72.4%), 12 (11.4%) and 4 (3.8%) participants spent three minutes or longer, two minutes and one minute, respectively on the average to clean their teeth during the COVID-19 lockdown period (**Table 3**).

Most participants, 86 (81.9%), reported that their oral hygiene habits remained the same during the COVID-19 lockdown period, while 19 (18.1%) reported that there was a change (**Table 3**). Among those that mentioned that their oral hygiene habit changed during the lockdown, 15 (14.3%) reported that the frequency of teeth cleaning became more frequent, while 4 (3.8%) mentioned that it became

less frequent (**Table 3**). Inconsistency with twice-daily cleaning was the reason given by all four participants for reduced frequency of teeth cleaning due to confinement at home. Among the participants, those with a positive change in their oral hygiene habit reported it to be due to increased frequency and duration of tooth cleaning attributed to having enough time on their hands 15 (100.0%).

A total of 75 (71.4%) participants indicated their willingness to visit the dental clinic for routine check-ups during the COVID-19 period. The majority of the participants, 67 (63.8%), would visit the dental clinic with their family members for routine teeth cleaning during the COVID-19 period (**Fig. 2**).

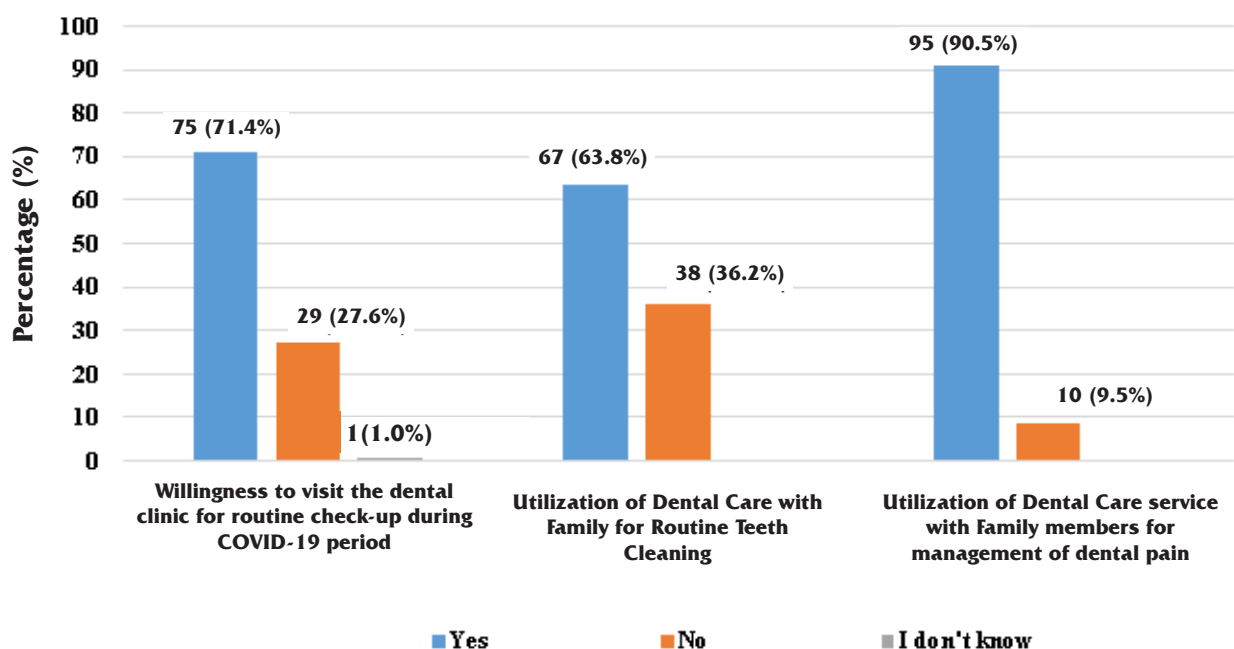


Fig. 2: Willingness of the participants to utilize dental care services during COVID-19 period.

Among those willing to consult the dentist for routine check-ups, 28 (26.7%) gave no particular reason, 20 (19.0%) would have come if invited by the doctors/staff of the clinic, and 7 (6.7%) had made it a routine behaviour (Table 4). Among those who will

visit the dental clinic if there was pain, 20 (19.0%) would do so for the emergency treatment because their last dental experience was highly satisfactory (Table 4).

Table 4: Reasons for willingness to visit the Dental Clinic during COVID-19 pandemic

Variable	N	%
Reasons for willingness to consult the dentist for routine dental check up		
Advice from the dentist	5	4.8
I clean my teeth regularly	7	6.7
Because it is good	5	4.8
Only if told from the clinic to come	20	19.0
If the need arises	2	1.9
If treatment is not expensive	2	1.9
If assured of my safety from COVID-19 at the clinic	2	1.9
Since it is just a routine check	3	2.9
To have my teeth checked and cleaned	1	1.0
To avoid teeth problem	1	1.0
Toothache	1	1.0
No reason/nothing	28	26.7
Total	77	73.3
Reasons for willingness for professional oral prophylaxis		
Because of its importance	12	11.4
To make my teeth cleaner	22	21.4
Advice from the dentist	2	1.9
To prevent dental issues	2	1.9
Because it's due	1	1.0
Only if told from the clinic to come	4	3.8
It's not expensive	2	1.9
No particular reason/nothing	6	5.7
Only if needed	4	3.8
For check up	10	9.5
If you assure me of my safety from COVID-19	2	1.9
Total	67	63.8
Reasons for willingness to seek emergency treatment of dental pain		
I was treated well the last time	20	19.0
To remain healthy	12	11.4
To relieve the pain	8	7.6

Because self-medication is not good	1	1.0
For proper care	18	17.1
I don't want to lose more teeth	2	1.9
It's not expensive	2	1.9
If the pain becomes persistent/severe	5	4.8
No particular reason	23	21.9
To prevent spread of the dental problem/complications	3	2.9
Total	94	89.5

Among those that would not come for routine check-ups, 9(8.6%) had no reason, and 6 (5.7%) feared contracting COVID-19 infection (**Table 5**). Table 5

shows the reasons given for unwillingness to come for routine dental check-ups.

Table 5: Reasons for unwillingness to visit the Dental Clinic during COVID-19 pandemic

Variable	N	%
Reasons for unwillingness to consult the dentist for routine dental check up		
Fear of contracting COVID -19 infection	6	5.7
Difficulty with transportation to the clinic	1	1.0
Not available	3	2.9
No dental problem	2	1.9
Dental clinics were locked down	2	1.9
No reason	9	8.6
Financial constraint	2	1.9
Busy schedule	3	2.9
Total	28	26.7
Reasons for unwillingness for professional oral prophylaxis		
Fear of contracting COVID -19 infection	9	8.6
Busy schedule	4	3.8
I don't have any dental problem	4	3.8
I'm not around/I travelled	7	6.7
Because of the implicated cost	4	3.8
I haven't heard of it before	2	1.9
No reason	5	4.8
To avoid shocking sensation on my teeth after the cleaning	1	1.0
Change of dental facility	1	1.0
Personal choice	1	1.0
Total	38	36.2

Reasons for non-willingness to seek emergency treatment of dental pain

Fear of contracting COVID-19 infection	1	1.0
Because of the cost implications	1	1.0
Busy schedule	1	1.0
Not satisfied with the last treatment	1	1.0
Distant location of the clinic	1	1.0
No particular reason/nothing	4	3.8
I'd prefer a tertiary dental facility	1	1.0
If the pain is not serious	1	1.0
Total	11	10.5

The fear of contracting COVID-19 infection, cost implication of dental treatment and distant location of the clinic were among the stated reasons for unwillingness to visit the dental clinic during the COVID-19 period despite the presence of dental pain (Table 5).

No association existed between the sociodemographic characteristics of participants and change in oral health behaviour during the COVID-19 pandemic lockdown (Table 6).

Table 6: Association between Sociodemographic Characteristics of the Participants and Change in Oral Hygiene Behaviour during COVID-19 Lockdown

Sociodemographic Characteristics	Oral Hygiene Behaviour		Total n (%)	p-value
	Unchanged n (%)	Changed n (%)		
Age				
< 16 years	10 (9.5)	4 (3.8)	14 (13.3)	0.745
17-34 years	28 (26.7)	4 (3.8)	32 (30.5)	
35-44 years	19 (18.1)	4 (3.8)	23 (21.9)	
45-59 years	14 (13.3)	4 (3.8)	18 (17.1)	
≥60 years	15 (14.3)	3 (2.9)	18 (17.1)	
Total	86 (81.9)	19 (18.1)	105 (100.0)	
Gender				
Male	39 (37.1)	6 (5.7)	45 (42.9)	0.272
Female	47 (44.8)	13 (12.4)	60 (57.1)	
Total	86 (81.9)	19 (18.1)	105 (100.0)	
Occupation Class				
Skilled	11 (10.5)	3 (2.9)	14 (13.3)	0.211
Unskilled	46 (43.8)	6 (5.7)	52 (49.5)	
Dependent	29 (27.6)	10 (9.5)	39 (37.1)	
Total	86 (81.9)	19 (18.1)	105 (100.0)	

Level of Education				
Primary	16 (15.2)	7 (6.7)	23 (21.9)	0.172
Secondary	34 (32.4)	3 (2.9)	37 (35.2)	
Tertiary	27 (25.7)	7 (6.7)	34 (32.4)	
None	9 (8.6)	2 (1.9)	11 (10.5)	
Total	86 (81.9)	19 (18.1)	105 (100.0)	
Marital Status				
Single	28 (26.7)	8 (7.6)	36 (34.3)	0.729
Married	53 (50.5)	10 (8.5)	63 (60.0)	
Widowed	5 (4.8)	1 (1.0)	6 (5.7)	
Total	86 (81.9)	19 (18.1)	105 (100.0)	

Discussion

To the best of our knowledge, limited studies have been conducted globally, and none was carried out in Africa to assess the extent to which the COVID-19 pandemic has affected dental patients in POHCC. This pilot study was aimed at determining the impact of COVID-19 pandemic lockdown on the oral health and oral health seeking behaviour of patients that attended a Primary Oral Health Care Clinic in Ibadan, Nigeria. Despite the COVID-19 lockdown, almost all the participants still cleaned their teeth, and only a few engaged in suboptimal oral hygiene practices. About 18.1% of the participants reported a change in their oral hygiene behaviour with very few skipping teeth cleaning. Fear of contracting COVID-19 infection was a reason for unwillingness to utilize dental care services even when there is pain.

This study showed that 67.6% of the participants received curative dental treatment to relieve their discomfort. On the contrary, a study done in Malaysia among adults showed that dental check-up and scaling were the top reasons people sought dental care even though many eventually received curative care¹². This finding could be because of differences in their oral health literacy level, as many of the participants in this study had not visited a dentist before their clinic presentation^{13,14}. It may also be alluded to poor dental attendance.

This is a novel study assessing how participants' oral hygiene and willingness to seek dental care services changed during the COVID-19 lockdown period because there were restrictions of movements in most parts of the world. In this present study, although only a few participants reported a change in their oral hygiene. The major reason for the change was related to spending more time at home. While some participants used the opportunity to devote more time to increasing the duration and frequency

of teeth cleaning, others used the abundant time spent indoor as an excuse for neglecting oral hygiene measures. The reason for this could be change in lifestyle associated with the COVID-19 pandemic. It is also a reflection of time as an important factor required for good oral hygiene practices. In addition, there is a need to promote oral health so that individuals can take up healthier choices to improve their oral health. Despite the COVID-19 pandemic's prevailing situation, many participants were willing to go for routine check-ups, routine scaling and pain management. This finding can be attributed to the regular oral health education promotion activities made available at the POHCC at each patient's appointment, which could be deemed effective as it seems the participants are motivated to utilize dental services. The role of chairside oral health education in good oral health practices has been reported¹⁵. Unwillingness to present for dental treatment was also a finding in this study and resulted from different factors, with fear of COVID-19 infection as the top reason. In addition, it was a clause by some of the participants who requested for a guarantee of safety from COVID-19 infection from the dentists. These findings had been similarly reported in a previous study^{16,17}.

Furthermore, it comes to light that individuals are aware of the fact that they can contract COVID-19 from the dental clinic, which is not surprising as fear of infection from the dental clinics has also been reported as a barrier to utilization of dental services by others¹⁸. Apart from the fact that dentists and other paradental staff should ensure their patients' safety, dental care service providers' safety should also be of paramount interest to them. Therefore, it becomes very important for dentists and other members of the team to undergo training on the prevention and management of COVID-19 infections and how it applies to the dental settings on regular

bases¹⁹. Some of the participants were adamant that they would not go for dental care no matter the pain intensity. This is a reflection of the weight of fear of being infected by COVID-19 in the dental centre¹⁷, among other factors mentioned by respondents. The need to promote oral health among the populace is important to limit the complications and impact of untreated dental diseases that could result if an attitude such as this becomes prevalent among the populace²⁰. Almost all (91.3%) the participants were of the opinion that putting calls across to them would be of great help in motivating them to be compliant with their dental appointments. This is an important social aspect of dentistry, brought to light, which should be further explored. The dental profession can tap into the innovative tele dentistry tool and use it as the first triaging tool for dental emergencies in primary care settings and other health care levels during this COVID-19 era²¹. This is also important in the absence of epidemics and pandemics to promote of oral health and general health among the populace^{22,23}. The advantages of the one-on-one interaction with specialists, which is evident from this study, include the appreciation of personal interaction by the study participants. In addition, more efforts need to be channelled into oral health awareness programs to educate the populace (especially at the grassroots level) about their oral health by incorporating stakeholders at different levels.

The main limitation posed by this study was that some of the patients provided the phone numbers of their spouses and relatives who resided far away. As such, they could not be reached directly. The study adopted the contact that patients provided during their registration, and the selection of the participants was based on those that had their numbers available. The exclusion of those whose numbers were not reachable from the study could have affected the adequate representation of the population of patients that visited the clinic at that time. On the other hand, this pilot study was conducted to assess how the lockdown may have affected individuals to provide data for the planning of oral health promotion programmes. In addition, the participants were asked about the details of their oral hygiene practices during the COVID-19 lockdown period. Some of them might not vividly remember what happened at that time, especially the elderly. However, we based our questions on a routine that would have formed part of everyone's lifestyle, and any change would not be difficult to remember.

In addition, those who have sought dental services

were the target population, so generalization to the general public is difficult. However, the study is a pilot study to assess how COVID-19 could have affected those who had positive dental care-seeking behaviour. Further studies are required to look in-depth at the factors identified in this study that affected oral health-seeking behaviour during the COVID-19 pandemic period since it will help dental professionals to holistically target different population groups in improving their oral health.

Conclusion

The impact of the COVID-19 pandemic was minimal on the oral hygiene practices of the study participants, with many having no change in their oral hygiene practices. The change in oral hygiene practices was in terms of the frequency and duration of teeth cleaning. While some had a positive change, few others had negative changes. We, therefore, recommend that follow-up of patients by phone calls should be part of the treatment protocol in dental clinics to enhance compliance with dental appointments.

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