Afr. J. Med. Med. Sci. (2022) **5**1(1)**,** 23-31

Oral hygiene practice among general outpatients in a tertiary hospital in North Central Nigeria

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Abstract
Aim: To assess oral hygiene practices in patients attending the General Outpatient Department (GOPD) of the University of Abuja Teaching Hospital, Gwagwalada, Abuja.
Materials and Methods: This was a cross sectional study of patients attending the GOPD of University of Abuja Teaching Hospital, Gwagwalada, Abuja, Nigeria. A semi structured pretested questionnaire was administered to 416 consecutively recruited adult patients that consented to participate in the study. Data collected were analyzed using SPSS version 23.
Results: The age ranged from 18 to 60 years with the mean age being 33.22 years (SD = 10.11). About 55% of the participants were females while 45.4% were males. Most (98.6%) of the respondents used toothbrush to clean their teeth and 62.0% brush their teeth twice a day. Only very few (1.7%) used dental floss to clean the interdental area while most respondents (92.1%) used toothpicks.. Half of the respondents brush for over 3 minutes. Irrespective of age groups or gender, most of our respondents (64.2%) preferred soft brush while and 28.1% preferred hard toothbrush. Just a little above half of our respondents (52.2%) preferred using tooth brush with big head while 40.1% preferred brushes with small head. While a very good number (at least 93.9%) replace their toothbrushes within 6 months. only one hundred and forty (33.7%) of our respondents had ever visited dentist while fifty-five (13.2%) did so within the past 12 months.
Conclusion: The oral hygiene practice among our study population was fairly good but need to be reinforced through various oral health education programs and outreaches with more emphasis on the use of dental floss and importance of regular visit to the dentist.

Key words: *Oral hygiene practice, tooth brushing, dental floss, dental visits*

Résumé
Objectif: Évaluer les pratiques d'hygiène bucco-dentaire chez les patients fréquentant le département général de consultations externes (GOPD) de l'hôpital universitaire de l'Université d'Abuja, Gwagwalada, Abuja.
Matériel et méthodes: Il s'agissait d'une étude transversale de patients fréquentant le GOPD de l'hôpital universitaire de l'Université d'Abuja, Gwagwalada, Abuja, Nigéria. Un questionnaire pré-testé semi-structuré a été administré à 416 patients adultes recrutés consécutivement qui ont consenti à participer à l'étude. Les données collectées ont été analysées à l'aide de la version 23 de SPSS.
Résultats: L'âge variait de 18 à 60 ans, l'âge moyen étant de 33,22 ans (ET = 10,11). Environ 55% des participants étaient des femmes tandis que 45,4% étaient des hommes. La plupart (98,6%) des répondants utilisaient une brosse à dents pour se nettoyer les dents et 62,0% se brossaient les dents deux fois par jour. Seuls très peu (1,7%) utilisaient du fil dentaire pour nettoyer la zone interdentaire tandis que la plupart des répondants (92,1%) utilisaient des cure-dents. La moitié des répondants se brossent les dents pendant plus de 3 minutes. Quels que soient les groupes d'âge ou le sexe, la plupart de nos répondants (64,2%) préféraient une brosse douce tandis que 28,1% préféraient une brosse à dents dure. Un peu plus de la moitié de nos répondants (52,2%) préféraient utiliser une brosse à dents à grosse tête tandis que 40,1% préféraient des brosses à petite tête. Alors qu'un très bon nombre (au moins 93,9%) remplacent leurs brosses à dents dans les 6 mois. seulement cent quarante (33,7%) de nos répondants avaient déjà consulté un dentiste alors que cinquante-cinq (13,2%) l'ont fait au cours des 12 derniers mois.
Conclusion: La pratique de l'hygiène bucco-dentaire au sein de notre population d'étude était assez bonne, mais doit être renforcée par divers programmes d'éducation en santé bucco-dentaire et des activités de sensibilisation mettant davantage l'accent sur l'utilisation de la soie dentaire et l'importance d'une visite régulière chez le dentiste.

Mots clés: *Pratique d'hygiène bucco-dentaire, brossage des dents, soie dentaire, visites dentaires*

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Introduction

A good oral health is the state of mouth free of any disease affecting the oral cavity and its surrounding structures [1]. Dental care can be described as the maintenance of healthy teeth, which involves the practice of cleaning the mouth and teeth, to prevent dental caries, periodontal diseases and other dental diseases. It can also be described as the professional care of teeth, including scaling and polishing and regular dental visits. The role of dental care in the general well-being of the body cannot be overemphasized. The teeth and their supporting tissues are directly connected to the blood stream through which infection may spread to other parts of the body. Therefore, proper care of the teeth can prevent systemic infection. Poor oral health affects people physically and psychologically by influencing how they grow, enjoy life, look, speak, chew, taste food and socialize.

The promotion of good oral hygiene at the population level is advocated and supported by the World Health Organisation (WHO) and the International Federation of Dentists (FDI) [2-5]. The adoption of preventive strategies both at the individual and population level helps reduce the negative impact of oral diseases including improving quality of life. One critical tool identified for achieving good oral health is the institution of effective and efficient oral hygiene practices [2,6,7]. To achieve and maintain good oral hygiene, and prevent dental caries regular tooth brushing using fluoride containing toothpaste at least twice a day is recommended [5]. The use of dental floss for cleaning of interproximal surfaces is also crucial for effective plaque removal [4,5].

The practice of these preventive measures in any setting is a measure of oral health in such community. The utilization of oral health care facilities is also an indication of the effectiveness of oral health promotion in a country. Previous reports indicated poor awareness of oral health, irregular tooth brushing and generally poor oral hygiene among Nigerians with only small proportion (less than 20%) visiting a dentist regularly [8-11]. This clearly shows that the practice of oral hygiene and utilization of oral health care resources is poor in the country. However, it must be pointed out that most information on oral hygiene practices among Nigerians is localized to south west regional zone where most of the oral health care facilities are located [8,9,10]. Therefore, conclusions from those studies may not be generalized to the country as a whole. Presently there are no studies from the North central zone of the country where the federal capital city of Nigeria is located. The Federal Capital City boasts of two tertiary hospitals offering tertiary dental services while there are many secondary and primary dental care facilities located in all the Area councils. Furthermore, the population of the region is growing rapidly as a result of the influx of many people to the Federal Capital; Territory. Therefore, a study on oral health practices of the population of Federal Capital Territory is necessary for health information, promotion and planning by government agencies and policy makers. Hence, this study was carried out to assess oral hygiene practices among the patients attending the general outpatient department of the University of Abuja Teaching Hospital, Gwagwalada, Abuja.

Materials and methods

This was a questionnaire based cross-sectional study to assess the oral hygiene practice among the patients attending the General Outpatient Department of the University of Abuja Teaching Hospital, Gwagwalada, Abuja. Pretested questionnaire was administered to 416 consecutively recruited adult patients that consented to participate in the study. The pretest was done among 25 adult patients haphazardly selected in a primary health clinic about 25km away from the hospital. The pre-test was done to ensure that the questions were acceptable; there was willingness to answer them and they were appropriate in eliciting responses that were consistent with the study objectives. Ambiguous questions were rephrased.

Ethical clearance for the study was obtained from the Ethics Committee of the hospital. To ensure confidentiality, the instruments for data collection was identified using codes and not respondents' names, the instruments was handled by only the principal investigator, the statistician and two trained research assistants.

Data collected was analyzed using Statistical Package for Social Science version 23 (SPSS 23). Analysis includes frequency and cross tabulation.

Results

Socio-demographic characteristics of respondents

A total of 416 respondents were interviewed. The respondents were patients assessing health care services at the General Out-Patient Department of the University of Abuja Teaching Hospital, Gwagwalada.

The age of the respondents at the time of the interview ranged from 18 to 60 years. The majority 44% (183) of the respondents were less or equal to 29 years while only about 27.0% (111) were 40 years or more. The number of female respondents was 227 (54.6%) as against 189 (45.4%) males. Two

Table 1: Socio-demographic characteristics of respondents

Characteristic	Frequency (n = 416)	Percentage (%)
Age		
≤29	183	44.0
30-39	122	29.3
≥40	111	26.7
Sex		
Male	189	45.4
Female	227	54.6
Educational status		
None	16	3.8
Primary	34	8.2
Secondary	120	28.8
Post-secondary	246	59.1

Table 2: Distribution of respondents by age group and sex

Age group	Sex		Total (%)
	Male (%)	Female (%)	
≤ 29	72 (39.3)	111 (60.7)	183 (100.0)
30-39	58 (47.5)	64 (52.5)	122 (100.0)
≥ 40	59 (53.2)	52 (46.8)	111 (100.0)
Total	189 (45.4)	227 (54.6)	416 (100.0)

$\chi 2 = 5.62$ p = 0.06

Fig. 1: Frequency of tooth brushing reported by respondents (n=416)

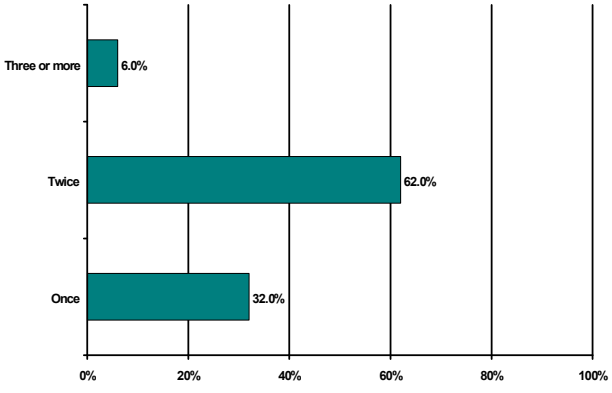
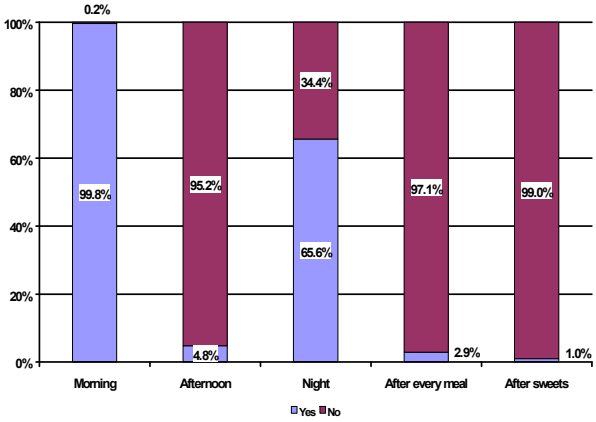


Fig. 2 Time of the day tooth brushing is done by respondents (n = 416)

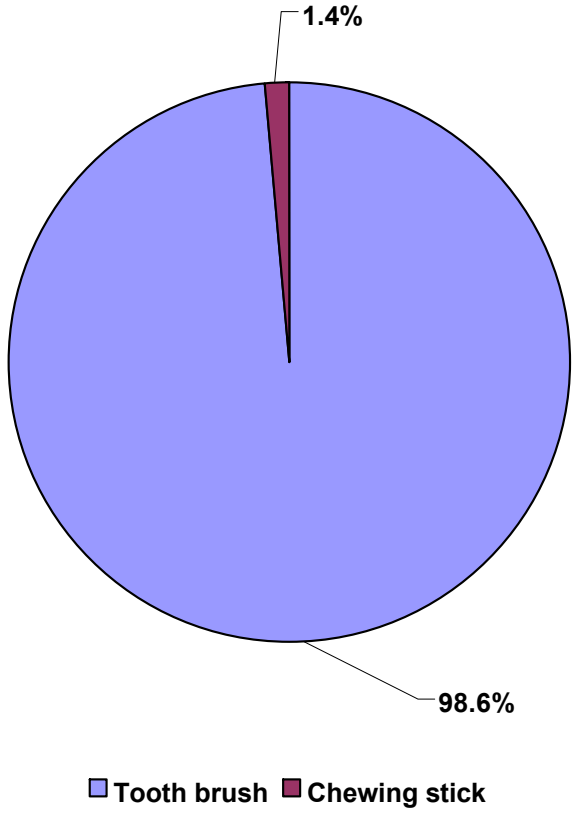


hundred and forty-six (59.1%) respondents attended post-secondary institutions while 3.8% of the respondents had no formal education. (Table 1)

Figure 1 indicated that, 62.0% (258) of the respondents brush their teeth twice a day; 32% brush once a day and 6.0% brush three or more times a day.

Almost all of the respondents (99.8%) brush their teeth in the morning, while 65.6% brush at night. About 3% brush immediately after every meal while 1% do so after taking sweets. Figure 2.

Fig. 3: Respondents choice of tool regularly used to keep the teeth clean (n= 416)



The popular tool among the respondents for cleaning their teeth on a regular basis was toothbrush (Figure 3); while others use chewing sticks. Toothpick, dental floss, matchstick, broom stick etc. were reported by respondents as tools used regularly

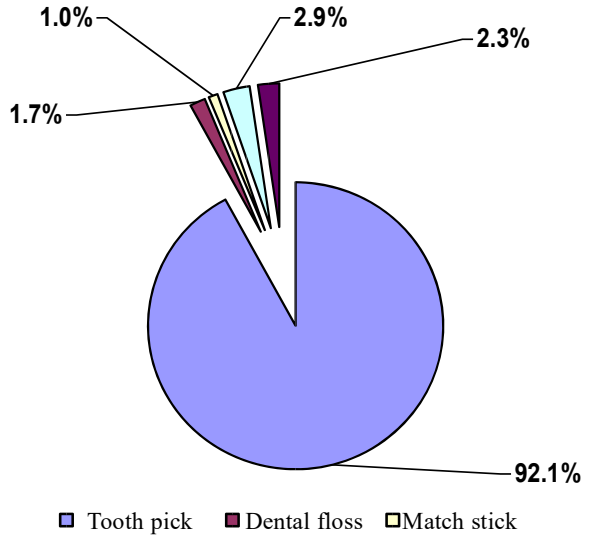


Fig. 4: Tool used to remove debris from between teeth regularly (n=416)

to remove debris from interdental spaces. The commonest tool in use was toothpick (92.1%) while dental floss was sparsely used (1.7%). (Figure 4)

Table 3: Distribution of respondents by duration of brushing teeth and sex

Duration	Sex		Total
	Male	Female	
<= 3 minutes	84 (41.4%)	119 (58.6%)	203 (100.0%)
4-10 minutes	85 (48.9%)	89 (51.4%)	174 (100.0%)
>= 11 minutes	13 (56.5%)	10 (43.5%)	23 (100.0%)
Total	182 (45.5%)	218 (54.5%)	400 (100.0%)

$\chi^2 = 3.305$, p = 0.192

The mean time reported for brushing was 4.72 minutes. Two hundred and three (50.8%) respondents reported brushing for less than or equal to 3 minutes at a time, 174 (43.5%) for 4-10 minutes and 23 (5.8%) for ≥11 minutes. (Table 3)

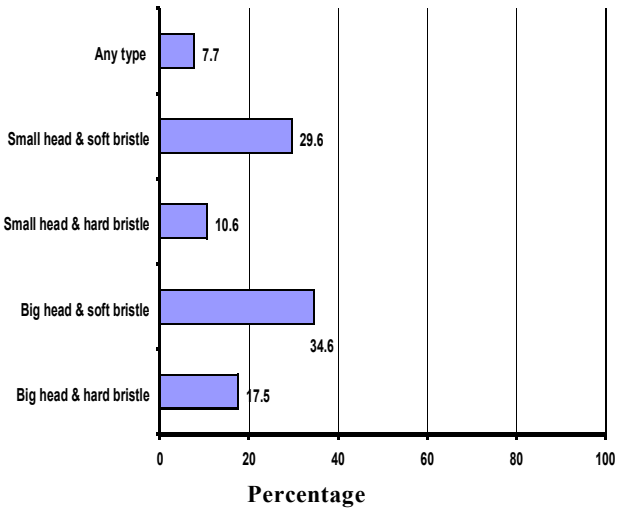
There was no significant gender difference in the time used for brushing between males and females (p = 0.192).

A higher proportion of the respondents (52.2%) preferred using toothbrush with big head whereas 40.1% preferred brushes with small head and 7.7% will use any size. Also, a majority of males and females preferred brushes with big head compared to any other type. The difference in these proportions was not significant (p = 0.068). Also, there was no significant difference in the preference to toothbrush size and age group. (p = 0.299). Table 4 Regarding the texture of toothbrush, most of the respondents (64.2%) preferred soft tooth brushes 28.1% prefer the hard ones, while 7.7% will go for any texture. There was no significant difference in the preference of toothbrush texture and age group.(p = 0.347). Table 5

Irrespective of age groups and gender, most respondents (64.2%) preferred soft brushes to clean their teeth. However the proportion of male that preferred hard toothbrush (38.1%) is higher than that of female 19.8% (Table 5)

When the preferred size and texture of toothbrush were pulled together, a higher proportion (34.6%) of the respondents preferred toothbrushes with big head and soft bristle. The next preferred size and texture of tooth brush was small head and soft bristle (29.6%). Thirty two (7.7%) of the

Fig.5: Distribution of respondents by preferred size and texture of toothbrush (n=416)



respondents will use any size and texture of brush available. (Figure 5).

On the average, respondents replace tooth brushes at 3.5 months. Most of the respondents (72.6%) replace their toothbrushes before or at 3 months. Interestingly, a high proportion 93.9% (357) of the respondents replace their tooth brushes within 6 months. (Figure 6).

One hundred and forty (33.7%) respondents admitted having visited a dentist before. (Figure 7). Out of this only fifty-five (13.2%) visited a dentist in the last 12 months.

Table 4: Distribution of respondents by age group, sex and preferred size of tooth brush

Characteristic	Big head	Small head	Any size	Total	X^2	p
Age group						
≤29	86(47.0)	83(45.4)	14(7.6)	183(100.0)	4.89	0.299
30-39	70(57.4)	41(33.6)	11(9.0)	122(100.0)		
≥40	61(55.0)	43(38.7)	7(6.3)	111(100.0)		
Total	217(100.0)	167(100.0)	32(100.0)	416(100.0)		
Sex						
Male	106(56.1)	65(34.4)	18(9.5)	189(100)	5.39	0.068
Female	111(48.9)	102(44.9)	14(7.4)	227(100)		
Total	217(52.2)	167(40.1)	32(7.7)	416(100.0)		

Table 5: Distribution of respondents by age group, sex and preferred texture of tooth brush

Characteristic	Hard	Soft	Any texture	Total	X^2	p
Age group						
≤29	43(23.5)	126(68.9)	14(7.7)	183(100.0)	4.46	0.347
30-39	40(32.8)	71(58.2)	11(9.0)	122(100.0)		
≥40	34(30.6)	70(63.1)	7(6.3)	111(100.0)		
Total	117(28.1)	267(64.2)	32(7.7)	416(100.00)		
Sex						
Male	72(38.1)	99(52.4)	18(9.5)	189(100.0)	21.27	0.00002
Female	45(19.8)	168(74.0)	14(6.2)	227(100.0)		
Total	117(28.1)	267(64.2)	32(7.7)	416(100.0)		

Figure 6: Interval at which tooth brush is replaced by respondent *(n = 380, mean = 3.5 months)*

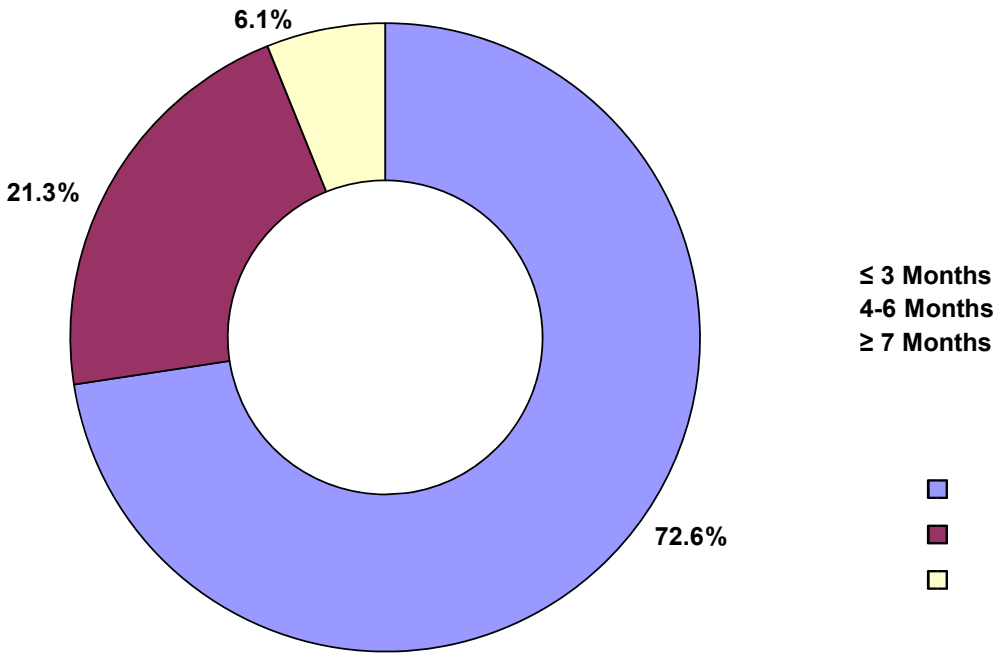
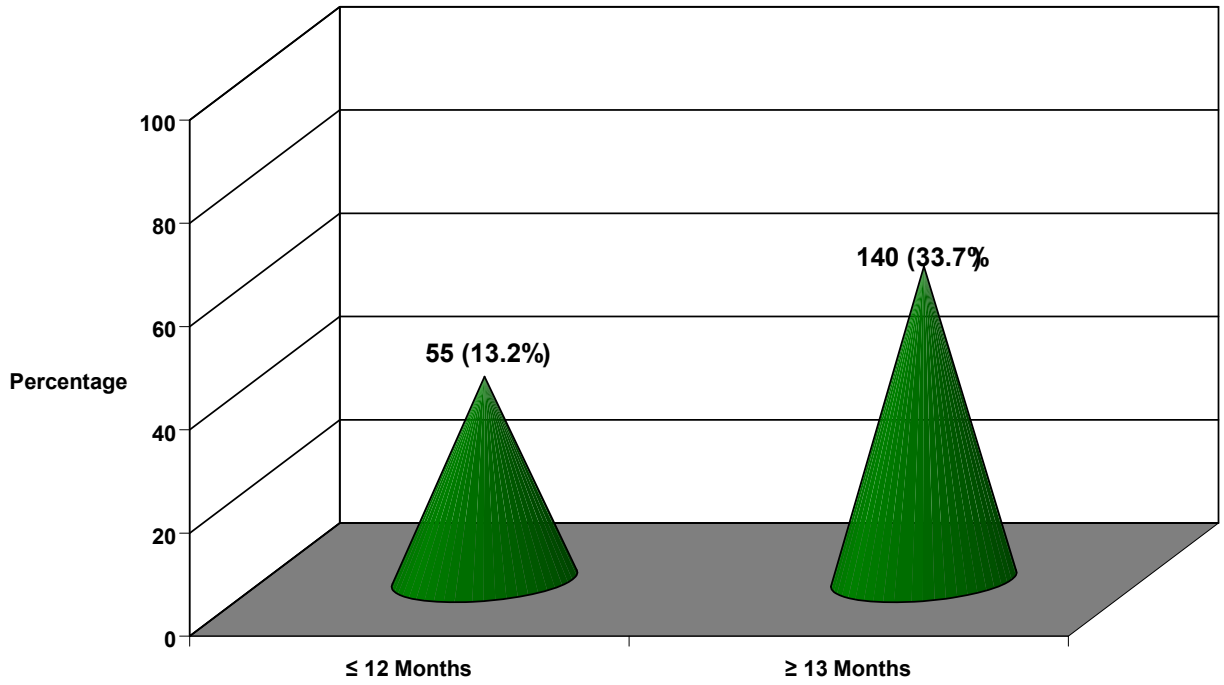


Fig. 7: Last visit to a dentist (Mean = 46 months)



Discussion

The majority of the respondents 98.6% use toothbrush and toothpaste as tools for cleaning their teeth. This is impressive and our findings agreed with several other reports from Lagos, San Francisco, Saudi Arabia and Karachi [12-15]. However, our finding is higher than 80% reported by Aliyu in Kano, Nigeria [16]. The reason for this difference may be due to socio-cultural differences between the two populations. Although Kano is a cosmopolitan city; it is rooted in traditions and cultures of the north which allows little western lifestyle influence. Whereas, Abuja is the Federal Capital of Nigeria and are mostly populated by civil servants who are well educated and have access to oral health education materials whether on television or radio.

The majority of the study population brush twice daily as recommended by dentists. This finding is comparable to a study by Jiang et al and by Al- Shammari et al. [17,18]. However, the proportion of subjects brushing their teeth twice daily (62%) in our study is higher than the proportions reported by Jain et al, Zhu et al. and Nagarajappa [19,20,21]. Furthermore, almost all of the respondents (99.8%) brush their teeth in the morning, however, only about 3% brush immediately after every meal. Similarly, the study of Ogunrinde et al showed that the majority of the respondents brushed their teeth before breakfast contrary to the dentist advice of brushing after meal so that food debris does not stay in the mouth for a prolonged period [22]. The reason for this habit is not known and it is worth exploring.

Regarding the texture of tooth brush, a good number of the respondents (64.2%) preferred using soft toothbrushes while some (28.1%) still preferred the use of hard ones. This is similar to the report of Ogunrinde et al where 67.2% of the participants preferred soft and moderate texture brushes and 30.6% preferred hard brushes [22]. The proportion of those using soft brushes in our study is however higher than that of Jain and Zhu et al where 10% and 27% of the subjects use soft brush respectively [19,20]. The reason for the differences is not clear but it may be due to habits such as coffee and tobacco use. Individuals who engage in such habits are known to have stained teeth and hence prefer hard brush to remove the stains from their teeth. These habits are not so common in our population.

Studies have shown that the use of hard brush has detrimental effects on the gingival health such as gingival recession [23,24]. Our study shows that the proportion of male that preferred hard toothbrush (38.1%) was significantly higher than that of female (19.8%). In Nigerian society, more men than women have been shown to be engaged in smoking and chewing of kola nuts which stains the teeth after prolong use [25]. Also, more

women have better oral health awareness and show better utilization of oral health care services than their male counterparts [26]. Hence women could have been exposed to teachings about the detrimental effects of hard toothbrushes.

The duration of brushing is important in the disruption of the bacterial plaque thereby reducing its ability to cause dental caries. Furthermore, the disruption of the plaque further enhances the health of gingival tissues. Therefore, adequate time of brushing is needed to achieve good oral hygiene. In this study about half of the respondents brush their teeth for 4 minutes and above. This is similar to the findings of Nagarajappa et al but lower than 69.1% that spent >4 minutes to clean and brush their teeth/ mouth in the study of Aliyu et al. [16,21]. The reason for the differences is not clear but could be due to recall bias.

Most respondents in this present study were found to have complied essentially with the recommendation of The American Dental Association to change toothbrush every 3–4 months [27]. This is similar to the studies outside Nigeria showing that their respondents replaced their toothbrush within two and six months [15,16,21]. The study did not find out if indeed the respondents change their toothbrushes as often as was reported based on the recommendation of the dentists or from other information channels. A further well controlled study may be able to elicit this information.

Toothpick, dental floss, matchstick and broom stick were reported by respondents as tools used regularly to remove debris from in-between the teeth. Only 1.7% of the respondents in this study used dental floss. This practice shows low dental awareness of the benefits of dental floss and the hazards of toothpicks and other harmful objects. Our finding is similar to that of Gopikrishna et al, Jain et al, and Jamjoom but lower than the values reported by Hamilton and Coulby [19,28,29,30]. No reason can be adduced for the similarities or the differences.

Dental floss are very short in supply in pharmacies and stores, and are not well promoted on radio and television advertisements. This might have been responsible for the low utilization of such device in this environment. There is therefore need for oral health education program to enlighten the populace on the use of dental floss as well as encourage various hospital management to make dental floss readily available in the hospital pharmacy and stores.

Reports have shown that only few Nigerians routinely visit dentists and mostly do so when in pain [22,31]. Our findings is in complete agreement with this statement as over 60% of the respondents claimed not to have visited a dental clinic before. This low dental attendance is comparable to the reports of other studies [1,16,22]. The reason for this low attendance has been documented in several publications from Nigeria [32,33]. These range from lack of awareness, lack of accessibility to dental facilities as they are mostly situated in the urban and rich settings and few dental professionals in the country.

Conclusion

The oral hygiene practice among our study population was fairly good. Most of the participants use toothbrush and toothpaste, brush twice daily for adequate period of time and change their toothbrushes within the period of 3-6 months as stipulated by The American Dental Association. However other good oral hygiene practices such as the use of dental floss and regular visit to dentists were still very poor. There is therefore a need for oral education programs to reinforce the good practice, discourage the use of harmful materials and encourage the use of dental floss and regular dental visits.

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Received = 22nd May 2020
Accepted = 13th August 2020